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Appendix E-4
Alternatives Development - Bronx River Package

Draft Integrated Feasibility Report & Environmental Assessment
February 2017

Prepared by the New York District,
U.S. Army Corps of Engineers

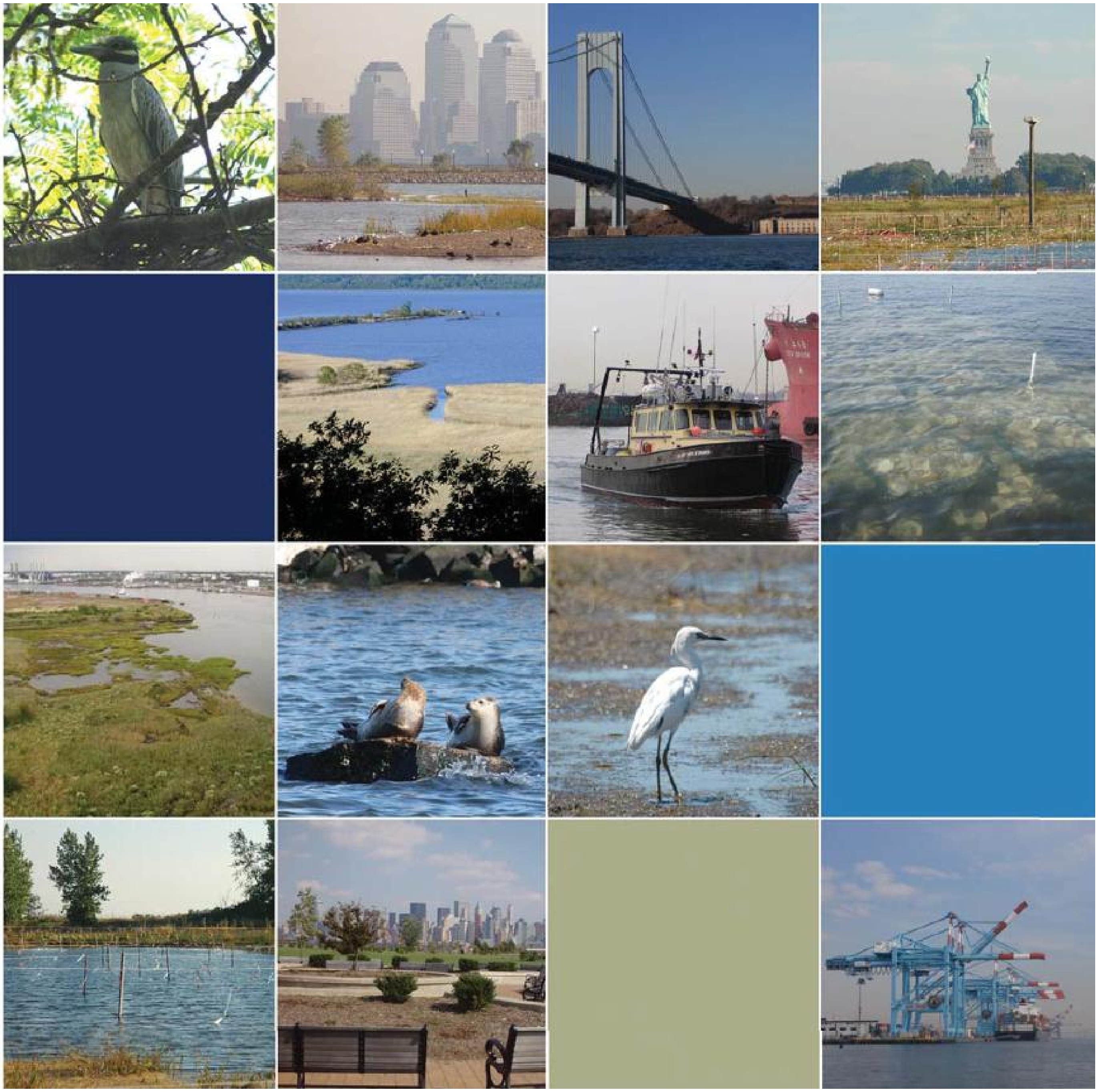
THE PORT AUTHORITY
OF NY & NJ

NYC Parks

NYC Environmental Protection

Westchester County New York

Department of Environmental Conservation New York State



Executive Summary

The Bronx River flows through suburban and highly urban communities in the Bronx and Westchester Counties, running through numerous parks and parallels and intersects the Bronx River Parkway and the Metro North Harlem commuter rail line. In the past, the Bronx River had a complex ecosystem, but due to industrialization, an upstream dam, channel modification, filling of wetlands, runoff from roadways, and other anthropogenic perturbations, the river ecosystem has depreciated over time. Water quality and aquatic life have suffered from impacts due to dams, pollution and urban development.

The Bronx River Ecosystem Restoration Feasibility “Source” Study conducted by the United States Army Corps of Engineers (USACE), the New York City Department of Environmental Protection (NYCDEP) and the Westchester County Planning Department and other partner activities (New York City Parks [NYC Parks]), Bronx River Alliance, other academic and private entities) have documented the river’s degradation and need for restoration. The Bronx River Feasibility Study identified a total of 330 restoration opportunities (USACE, 2007), evaluated the sites and screened the sites to determine a focused array of 10 sites.

Baseline existing conditions were evaluated at the 10 sites and a reference site during the summer of 2014.and restoration measures were identified to restore ecological function at each site.

The field investigations quantified the ecological value of natural habitats, mapped existing habitats, noted any potential cultural heritage features, and identified existing infrastructure (e.g., existing outfalls, etc.) and access constraints for future restoration planning. In addition to data gathered during the field studies, information on site geology, historic river geomorphology, sediment transport and soils were compiled and analyzed and provided in Engineering Appendix D. Potential uniqueness and heritage elements data were also obtained through review of the State Historic Preservation Office materials and a cultural resource survey study conducted by the USACE of the Bronx River in 2014. The baseline conditions were used as the basis for determining the appropriate restoration actions/measures to restore ecological function at each site.

The baseline ecosystem function at the sites were assessed with the Evaluation of Planned Wetlands (EPW) technique supplemented with the Natural Resources Conservation Service’s (NRCS) Stream Visual Assessment Protocol (SVAP), a stream-specific functional assessment.

The EPW technique was used to determine baseline ecosystem function at the sites. The EPW evaluates a site on six (6) major wetland functions or functional capacity indicators (FCIs): shoreline bank erosion control (SB); sediment stabilization (SS); water quality (WQ); wildlife (WL); fish (tidal fish [FT], non-tidal stream/river [FS], non-tidal pond/lake [FP]); and uniqueness/heritage (UH). The FCIs were then multiplied by the wetland assessment area (WAA), the approximate acreage of studied wetlands at a site, to derive the functional capacity units (FCUs). The FCIs represent the “quality” of functional capacity per unit area, whereas the FCUs represent the “quantity” of functional capacity. The results of the EPW baseline scores for the 10 project sites are located in Chapters 7 and 12 of this Appendix.

The EPW metrics are scored independently with separate FCIs calculated using equations that vary in metric weighting. This methodology led to the reference site, a natural channel ecosystem with limited human disturbance, scoring equal-to-or-lower-than some of the project sites for some of the FCIs. With

regard to the application of the EPW on the existing conditions of the Bronx River project sites, several reasons can explain this outcome:

- The EPW does not consider typical anthropogenic infrastructure as a negative for those FCIs relating to stability.
- The EPW does not consider sewage or other non-hazardous human inputs in the WQ calculation.
- Indicators of quality fish habitat are not factored into the WQ FCI; they are only factored into the FS FCI.
- The EPW methodology focuses on wetland functional indicators, as opposed to specific indicators of stream functionality.

Based on these factors, it is not necessarily useful to compare the EPW baseline scores for the project sites to one another or even the reference site. However, the baseline FCIs and FCUs are compared to the scores for the proposed site improvements presented in the conceptual alternatives to quantify the ecological uplift on a site-specific basis.

To supplement the EPW, NRCS's SVAP, a stream-specific functional assessment, was used to assess hydrologic, habitat, and morphologic stream conditions that were not addressed within the scope of the EPW. An overall SVAP assessment score under six (6) is determined to represent poor conditions and a score over nine (9) denotes excellent conditions. Sites with fewer impacts to their natural stream geomorphology, as well as sites with less development/disturbance in their riparian buffers and adjacent uplands, scored higher. The results of the SVAP scores are provided in Chapters 8 and 11 of this Appendix.

A request letter was sent to the New York Natural Heritage Program (NYNHP) for known occurrences of threatened and endangered species within or near the project sites. Based on the correspondence with NYNHP, there are no recent records of threatened and endangered species at the project sites. With respect to cultural resources, a 2015 study conducted by the USACE determined that the restoration measures have the potential to impact significant historic properties including historic and archaeological sites and standing structures identified throughout the Bronx River study area (e.g., historic dams, mill sites, pre-Contact archeological sites, etc.) that may be uncovered during excavation and grading activities. If eligible resources are encountered, and cannot be avoided by project plans, then a Memorandum of Agreement (MOA) between USACE, the State Historic Preservation Office (SHPO) and, possibly, the Advisory Council on Historic Preservation must be developed based on the results of the cultural resource studies conducted for the project and on project plans as they develop. .

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Chapter 1: Introduction

The Bronx River Ecosystem Restoration Feasibility "Source" Study was initiated in 2003 and is within the Harlem River, East River, and Western Long Island Sound Planning Region. During the study, approximately 330 restoration opportunities were identified and assessed within the basin. The screening of initial sites resulted in the selection of a focused array of 10 sites that were evaluated in greater detail (Table 1-1), in the Bronx and Westchester Counties (see Section 3.6 of main report).

Following site selection, the current conditions were assessed at the 10 sites, as well as one (1) reference site in Westchester County, to establish baseline function and document existing conditions at each site. The baseline conditions were then used as the basis for determining the appropriate restoration measures to be recommended for each site in a future phase.

Table 1-1: Bronx River Ecosystem Feasibility Study Project Sites

Site	County
River park/West Farm Rapids Park –Site 860	Bronx County
Bronx Zoo –Site 861	
Stone Mill Dam –Site 863	
Shoelace Park –Site 113	
Muskrat Cove –Site 862	
Bronxville Lake –Site 851	Westchester County
Crestwood Lake –Site 852	
Harney Road –Site 853	
Garth Woods –Site 853	
Westchester County Center –Site 854	
Reference Site – Mianus River Gorge	

To quantify the existing conditions at the sites, the Bronx River Field Team (BRFT), consisting of a senior ecologist (AECOM), senior ecological engineer (AECOM), senior civil engineer or geologist (e4sciences), junior geologist (e4sciences), and United States Army Corp of Engineers (USACE) staff, conducted field investigations in the summer of 2014. These investigations included functional assessments, utilizing the Evaluation of Planned Wetlands (EPW) technique and the Natural Resources Conservation Service's (NRCS) Stream Visual Assessment Protocol (SVAP), as well as habitat and feature mapping for each site. Several of the EPW data sheets were modified to provide for a quantitative assessment of the river's upland buffer habitats and an Upland Buffer data sheet, created by the USACE, was used to further qualitatively assess the upland areas. The SVAP and Upland Buffer assessment were used to inform the formulation of restoration alternatives only and did not factor into the benefits calculation or total Average Annual Functional Cumulative Units (AAFCUs) for an alternative.

This Bronx River Package documents the baseline conditions, site screening, EPW methodology results (Attachment A), AAFCU scores calculated from the EPW scores (Attachment B), and SVAP methodology results (Attachment C), as well as the findings of the field investigations and desktop studies. Attachment D contains the Upland Buffer data sheets for each site, Attachment E contains the annotated aerial site maps depicting existing conditions and features, Attachment F contains the uniqueness/heritage site information, and Attachment G contains photo logs for each site (photos can be provided on DVDs upon request). Attachment G contains the alternative maps for each site.

Chapter 2: Project Area Context

The Bronx River is 23 miles long, flowing through both suburban and highly urban communities in the Bronx and Westchester Counties. For much of its length, the river runs through numerous parks and parallels and intersects the Bronx River Parkway and the Metro North Harlem commuter rail line. The majority of the river is fresh water, with tidal influences in the most downstream section of the river where it exchanges flow with the East River and the Long Island Sound.

Review of the 1891 and 1892 United States Geological Quadrangles that cover the project area[1] show that the Bronx River north of the Bronx Zoo had a sinuous morphology in a narrow valley and a complex ecosystem of marshes, wetlands, and upland habitat[2]. As described in the Geotechnical and Geological Report in Engineering Appendix D, the natural narrowness of the riverbed is due to existing bedrock.

Centered in a densely populated region and with a long history of industrialization, the Bronx River has been significantly altered and disturbed over the past 200 years. Historic upstream damming, which includes an earthen/gravel dam built in 1885 and the larger Kensico Dam completed in 1917, reduced water flows, causing a narrower normal flow channel with a smaller cross section than existed historically. From 1907 to 1925, efforts were made to clean up the Bronx River from the Bronx Zoological Gardens to the Kensico Dam and resculpture the surrounding lands to create the Bronx River Parkway Reservation, a linear park along a limited access roadway. These efforts, as well as the 1905 building of a sewage trunk line and removal of buildings and dumps along the river, greatly reduced inputs of human sewage in the river. However, other work, including dredging and rechanneling the river to remove stagnant pools and increase flow and draining and filling of adjacent wetlands and marshes, impacted the river's natural historic ecology.

Subsequent to 1925, the Bronx River Parkway was widened and straightened and the already narrow valley was further narrowed by the development of adjacent roadways. The riverbanks were also lined with rock and concrete to aid in straightening the river to match the lines of nearby highways and railroads, reducing natural shoreline habitat. The parkway reservation north of Bronxville has retained much of its original parkland and is listed in National Register of Historic Places, while to the parkland south of Bronxville has decreased.

Although some fragments of open space and forest still exist within the river corridor, most of the lower Bronx River watershed has been urbanized, channels straightened, streambanks altered and armored, and surrounding undisturbed habitat developed, such that the river's riffle-pool complex is inconsistent and interrupted. Increased development, non-point source pollution, combined sewer overflow (CSO) discharges, invasive species, excessive runoff, sediment, and road salt and sand have historically and continue to detrimentally affect the river's ecology. In many of the more urban sections of the river's watershed, impervious surfaces in the surrounding watershed exceed 70 percent of the land coverage, leading to excessive runoff and storm-related flooding conditions. The result is a river that rises and falls quickly because stormwater flows to it, not through the soil and tributaries, but through pipes that deliver polluted water directly from surrounding roads and roofs.

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[1] United States Geological Service, 1891, Harlem NY-NJ 15 minute topographic quadrangle map & United States Geological Service, 1892, Tarrytown, NY-NJ 15 minute topographic quadrangle map.

[2] Crimmens, Teresa (Bronx River Alliance) & Larson, Marit (City of New York Parks & Recreation, Natural Resources Group, June 2006, Bronx River Alliance Ecological Restoration and Management Plan, Bronx River Alliance, Bronx, New York.

The Bronx River's ecosystem has been further impacted by existing dams (Appendix C) that alter water quality and impede fish passage, especially anadromous fish (e.g., alewife, etc.) that used to spawn in the river. However, despite being highly affected by pollution and urban development, the Bronx River and adjacent habitats support aquatic insects, fish, small mammals, and diverse vegetation.

Since the 1970s, concerted efforts have been made by local community organizations and governmental agencies to improve and/or restore the river and its watershed. A variety of governmental agencies, including Westchester County, the City of New York, the New York State Attorney General, and the USACE, as well as non-governmental organizations, such as the Bronx River Alliance, are currently working on a variety of restoration projects on the river and in its surrounding neighborhoods. A list of these projects can be found in Appendix B, Prior Reports and Ongoing Restoration Efforts within the Hudson Raritan Estuary. The Bronx River Alliance Ecological Restoration and Management Plan[1] defines an appropriate restoration intent, stating:

> *…in the Bronx River corridor, landform features, stream morphology and vegetation patterns have been so heavily altered that most of the characteristics of a healthy river can never be completely restored. Instead, a more realistic objective is to increase the number and length of river reaches which meet the conditions of an ecologically functional river in order to create a system that is sustainable and resilient and that possesses desired ecosystem conditions.*

For this project, the focus of the various enhancement, restoration, and stabilization measures will be based on this objective, aiming for increased ecological health, stabilization, and water quality improvements at each of the sites.

Chapter 3: Site Screening

As part of the Bronx River Feasibility Study, studies were conducted in the Bronx River to identify and evaluate the water resources problems, needs and opportunities that will support environment restoration, and an aquatic wetland habitat necessary for a healthy Bronx River Basin ecosystem. The *Bronx River Basin, New York. Ecosystem Restoration Study Watershed Opportunities Report* (USACE, 2010) summarizes the baseline conditions in the basin and identifies restoration opportunities through the development and use of Geographic Information System (GIS) analysis. The GIS analysis integrated data collected from multiple sources in a spatial form that enabled the USACE and project sponsors to justify and prioritize restoration sites and activities. The opportunities identified via the GIS analysis show areas where those future strategies would provide for wetland and aquatic habitat; potential flood risk management; riparian wildlife habitat; stream channel shading and cooling for aquatic species; water quality improvement through nutrient and pollutant removal, and decrease in erosion or sedimentation (USACE, 2010).

The major environmental problems in the Bronx River Basin are extensive habitat loss and degradation, which have reduced the quantity, diversity, functional and structural integrity of the overall ecosystem, and its ability to provide valuable diverse and sustainable services, negatively affecting human health (USACE, 2010). Also, impacts to water quality are substantial along the entire length of the Bronx River. Industrial and residential sources of pollution have degraded water quality in the Bronx River for more than 100 years (USACE, 1999 as cited in USACE, 2010). Nutrient Loading, pathogens contamination, and sedimentation are major factors to lowering water quality. The 2010 report also identified previous biologic evaluations, hydrologic analyses, wetland assessments, and hazardous, toxic or radioactive waste (HTRW) evaluations.

The identification of 330 restoration opportunities was guided by: relevant Target Ecosystem Characteristics (TECs) developed as part of the Hudson Raritan Estuary Comprehensive Restoration Plan (USACE, 2016); data on habitat impairments (dams, contaminant hotspots); existing catalogues of restoration opportunities (as identified by Westchester County or the Bronx River Alliance); and available open spaces. Of these 330 sites, 23 were deemed to have Federal interest because of their potential for high value habitat restoration and water quality improvements (the latter being an auxiliary benefit from USACE perspective), and were selected for further investigation in this study. Potential restoration measures at these 23 sites included:

- Excavation of historic fill to proper wetland elevations;
- Deposits of clean fill to provide healthy substrate for native flora & fauna;
- Excavation of hard fill to soften riverbanks;
- River bank stabilization;
- Wet excavation to restore stream geomorphology;
- Placement of boulders to create riffles to restore stream geomorphology;
- Removal of invasive vegetation;
- Native plantings (wet meadows) to act as buffer for wetlands;
- Dam removal to restore fish passage;
- Culvert replacement to restore fish passage;
- Fish ladders and rock ramps to restore fish passage;
- Installation of in-stream structures to redirect flow and recreate a more natural riverine channel in the northern portion of the site; and
- Installation of improved catch basins, sediment forebays, and vegetated swales to act as sediment traps at multiple point source pollution locations.

Of the 23 sites selected for further investigation, a subset of 10 sites were selected for feasibility level analysis. Sites were selected on the basis of their potential to contribute to restoration of the watershed and non-Federal sponsor acceptability.

Chapter 4: Field Data Collection and Assessment Approach for Bronx River

To accomplish the project goals, the BRFT employed a specific field approach at each site, focusing on accomplishing three (3) broad goals:

- Collect data and accurately characterize existing conditions for the EPW (Attachment A), SVAP (Attachment C), and upland buffer (Attachment D) baseline assessments.
- Review the existing HRE CRP restoration alternative and confirm the sufficiency of the approach.
- Identify additional restoration measures to support additional alternatives, focusing on highest ecological benefit/uplift, long-term success, and economic feasibility.

The field data collection and assessment effort was executed as follows:

- On June 19, 2014, the BRFT performed a one (1) day general reconnaissance of the project sites to scout out access locations and any potential field work constraints.
- Upon arrival at each site, the BRFT started the investigation at the downstream location and traversed upstream. The BRFT examined the stream channel, any adjacent wetlands, and the surrounding upland buffers on both sides. Specific field data collection included Global Positioning System (GPS) information for specific features, photographs, and hand-sketches of

existing terrestrial and aquatic habitats and vegetative communities within the site's project boundary. Habitats were classified per the *Ecological Communities of New York State*[3], although, due to the high degree of disturbance identified at most sites, many habitats were classified as urban.

- To support the EPW, SVAP, and upland buffer baseline assessments during the field investigations, the BRFT identified various conditions and features including:
    - Stream channel/bank and riparian buffer/upland conditions;
    - Dominant vegetation in each habitat/vegetative community;
    - Anticipated fauna usage within each habitat;
    - Outfalls and other conveyances of hydrology;
    - Human-induced and natural/wildlife impacts; and
    - Evidence of flooding and water level fluctuations.
- Concurrent with the field investigations, desktop studies of potential uniqueness and heritage elements, as well as water quality classifications, were gathered for each site.
- Following the field investigations, the senior ecologist and senior ecological engineer met together to complete the EPW, SVAP, and upland buffer data sheets for each site. Following the completion of the sheets for all the sites, the sheets and the resulting Functional Capacity Indicators (FCIs) were re-reviewed and compared to ensure that the various elements were scored consistently across the sites.

Chapter 5: Field Investigation Results

5.1 General Field Observations

During the field investigation, healthy and sizable habitats, such as forests, large wooded buffers, large tracts of wetlands, etc., were rarely observed. Wetlands, in particular, were often narrow, sparsely vegetated strips along the Bronx River's banks. At many sites, the banks were steeply sloped, poorly vegetated, and frequently subject to scour and erosion. Disturbed conditions have led to the colonization of many of the banks and riparian buffers by invasive species, namely Japanese knotweed (*Fallopia japonica*).

As the Bronx River flows north to south, the surrounding landscape becomes increasingly urbanized. The northern most site investigated, Westchester County Center, has large open lawns that abut both sides of the river, with woodlots separating the river from the surrounding development. The southernmost sites, River Park/West Farm Rapids Park and Shoelace Park, are completely surrounded by urban infrastructure, causing significant anthropogenic stresses on their ecosystems.

The placement of dams and weirs along the Bronx River has served as an impediment to fish passage and has inadvertently contributed to lower water quality. The damming of the river to create park lakes has resulted in widened, shallow waterbodies with slow moving water. Sewage, animal waste, sediment-laden runoff, and other pollutants have also affected the river. In three (3) of the southern sites, River Park/West Farm Rapids Park, the Bronx Zoo, and Stone Mill Dam, as well as one of the northern sites, Bronxville Lake, a strong sewage smell was encountered during the field investigation.

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[3] Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors), 2014, Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Conversely, the reference site, the Mianus River Gorge in Bedford, New York, was in a densely wooded gorge with limited anthropogenic developments within its riparian buffer. The Mianus River site also showed signs of hydrologic connectivity with the floodplain within the riparian buffer, evidenced by hydrological indicators and numerous forested wetland and vernal pool pockets and larger tracks of emergent wetlands. There was some evidence of impacts due to recent watershed development, but in general the stream's ecosystem appeared to be of high quality.

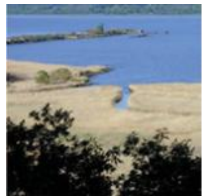
Various native and invasive plant species were identified within the upland and wetlands at each site. Table 5-1 identifies the observed plant species at each site.

Table 5-1: Plant Species Observed At Each Site

Cover type	Common Name	Scientific Name	River Park/ West Farm Rapids Park	Bronx Zoo and Dam	Stone Mill Dam	Shoelace Park	Muskrat Cove	Bronxville Lake	Crestwood Lake	Garth Woods	Harney Road	Westchester County Center	Reference Site: Mianus River Gorge
T	Alder	*Alnus spp.*	X	X	X			X	X			X	
T	American elm	*Ulmus Americana*	X	X		X		X	X	X		X	X
T	Ash	*Fraxinus spp.*	X	X									X
T	Basswood	*Tilia Americana*						X	X		X	X	
T	Beech	*Fagus grandifolia*			X					X	X		X
T	Birch	*Betula spp.*			X	X							
T	Black cherry	*Prunus serotine*		X				X	X			X	
T	Black locust**	*Robinia pseudoacacia*		X			X	X					
T	Box elder	*Acer negundo*		X	X	X		X				X	
T	Eastern cottonwood	*Populous deltoides*										X	
T	Eastern hemlock	*Tsuga canadensis*											X
T	Hackberry	*Celtis occidentalis*		X			X			X	X		
T	Hickory	*Carya spp.*				X		X					
T	Mulberry	*Morus spp.*					X						
T	Norway maple**	*Acer platanoides*				X	X	X	X				
T	Oak	*Quercus spp.*					X						
T	Red maple	*Acer rubrum*	X			X				X	X	X	
T	Pin oak	*Quercus palustris*			X	X		X					
T	Red oak	*Quercu srubra*			X	X			X				X
T	Sassafras	*Sassafras albidium*			X							X	
T	Silver maple	*Acer saccharinum*				X	X	X	X			X	
T	Sugar maple	*Acer saccharum*					X	X	X				X
T	Sweetgum	*Liquidambar styraciflua*					X	X		X			
T	Sycamore	*Platanus occidentalis*	X			X	X						
T	Tree of Heaven	*Ailanthus altissima*		X			X		X				
T	Tulip tree	*endron tulipifera*									X	X	
T	Willow	*Salix spp.*		X			X	X	X				
T	White pine	*Pinus strobus*						X					
S	Buckthorn*	*Rhamnus cathartica*											
S	Elderberry	*Sambucus spp.*					X		X				
S	Honey locust	*Gleditsia tricanthos*				X							
S	Honeysuckle*	*Lonicera maakii*				X						X	
S	Arrowwood	*Viburnum dentatum*		X		X			X				
S	Multiflora rose*	*Rosa multiflora*							X	X	X		X
S	Red osier dogwood	*Cornus stoloniferia*				X			X			X	X
S	Rose	*Rosa spp.*			X			X				X	
S	Rubus	*Rubus spp.*											
S	Serviceberry	*Amalenchier spp.*						X	X				
S	Sumac	*Rhus typhina*										X	
S	Willow	*Salix spp.*							X		X		





Cover type	Common Name	Scientific Name	River Park/ West Farm Rapids Park	Bronx Zoo and Dam	Stone Mill Dam	Shoelace Park	Muskrat Cove	Bronxville Lake	Crestwood Lake	Garth Woods	Harney Road	Westchester County Center	Reference Site: Mianus River Gorge
V	Grape	*Vitis spp.*	X			X	X		X			X	
V	Japanese hops*	*Humulus japonicus*			X	X	X		X		X	X	
V	Nightshade	*Solanum dulcamara*			X								
V	Poison ivy	*Toxidendron radicans*		X					X			X	
V	Virginia creeper	*Parthenocissus quinquefolia*	X	X	X	X		X	X	X	X		X
H	Rosette grasses	*Dicanthelium spp.*										X	
H	Poa grass	*Poa spp.*										X	
H	Arrowleaf tearthumb	*Persicaria sagittata*							X				
H	Aster	*Asteraceae sp.*			X						X	X	
H	Cattails	*Typha spp.*							X		X		
H	Chicory	*Cichorium intybus*	X			X		X	X			X	
H	Cinnamon fern	*Osmundastrum cinnamomeum*				X				X			X
H	Clover	*Trifolium pratense*			X		X					X	
H	Common reed*	*Phragmites australis*						X	X			X	
H	Creeping jenny	*Lysimachia nummularia*	X					X	X	X	X	X	X
H	Garlic mustard*	*Alliaria petiolata*	X			X	X	X		X	X	X	
H	Goldenrod	*Soliadgo spp.*	X			X							
H	Dock	*Rumex spp.*				X	X	X	X				
H	Grass	*Gramiaceae*	X	X	X	X	X	X	X	X	X	X	X
H	Ground ivy	*Glechoma hederacea*			X	X	X	X			X	X	
H	Hosta	*Hosta spp.*						X					
H	Horsetail	*Equisetum spp.*							X		X	X	
H	Japanese knotweed*	*Fallopia japonica*	X	X		X	X	X	X	X	X	X	
H	Japanese stilt grass*	*Microstegium vimineum*		X					X	X		X	X
H	Jewelweed	*Impatiens capensis*	X	X		X	X	X	X	X	X	X	X
H	Joe-pye weed	*Eutrochium maculatum*											
H	Lambs quarters	*Chenopodium album*	X	X		X							
H	Mallow	*Althaea spp.*							X				
H	Maple (seedling)	*Acer spp.*	X										
H	Milkweed	*Asclepias spp.*							X			X	
H	Moss	*Brtophyta*	X	X	X	X	X	X	X	X	X	X	X
H	Mugwort*	*Artesemia vulgaris*	X			X	X	X				X	
H	Pineapple weed	*Matricaria discoidea*		X			X	X	X				
H	Plantain	*Plantago spp.*	X	X					X				
H	Pokeweed	*Phytolacca americana*						X	X		X	X	
H	Loosestrife	*Lythrum spp.*		X		X	X	X					
H	Pennsylvania knotweed	*Polygonum pensylvanicum*	X	X	X	X	X	X	X		X		X
H	Purple loosestrife*	*Lythrum salicaria*		X			X				X		
H	Queen Anne's lace	*Daucuscarota*					X		X		X	X	

Cover type	Common Name	Scientific Name	River Park/ West Farm Rapids Park	Bronx Zoo and Dam	Stone Mill Dam	Shoelace Park	Muskrat Cove	Bronxville Lake	Crestwood Lake	Garth Woods	Harney Road	Westchester County Center	Reference Site: Mianus River Gorge
H	Sedge	*Carex spp.*		X		X		X	X		X	X	X
H	Sensitive fern	*Onoclea sensibilis*											X
H	Skunk cabbage	*Symplocarpus foetidus*							X	X		X	X
H	Soft rush	*Juncus effusus*		X								X	
H	Stinging nettle	*Urtica dioica*							X			X	
H	Thistle*	*Cirsium sp.*									X	X	
H	Timothy	*Phleum pratense*	X				X						
H	Trilium	*Trilium sp.*											X
H	Water purslane	*Ludwigia spp.*		X					X				X
H	Violet	*Viola sp.*	X	X	X	X	X	X	X	X	X	X	
T=tree S=shrub V=vine H= herbaceous, * Prohibited invasive species (NYSDEC, 2014), ** Regulated invasive species (NYSDEC, 2014)													

5.2 Site-Specific Observations

The following is a brief description of the field observations at each site. The sites are in order of their location from south to north, with the first five (5) in the Bronx and the last six (6), including the reference site, in Westchester County.

5.2.1 Site 860. River Park/West Farm Rapids Park

The River Park/West Farm Rapids Park site is approximately 900 feet in length, bisected by 180th Street, and located within a densely populated, urban area. The site is substantially affected by anthropogenic pressures, as it is surrounded by commercial and residential developments, roads, and urban parks with limited and/or disturbed natural areas. During the site visit, refuse was seen strewn throughout the site and a distinct sewage odor was encountered. In April 2007, a Microbial Source Tracking Study was conducted for the USACE (USACE, 2007). Data collected in the study identified a clear trend of increasing fecal coliform bacteria as you proceed downstream towards the lower segments of the Bronx River (USACE, 2007).

Wetlands: Wetland resources are extremely limited; the observed wetlands occur in a few very small pockets and are sparsely vegetated.

Uplands: Uplands within the site consist of developed areas and an urban park, interspersed with a few small woodlots. The woodlots are fragmented and offer limited, if any, habitat resources to organisms not adapted for an urban environment. The site's uplands are further impaired by garbage and stormwater runoff.

Stream Channel and Banks: The Bronx River's benthic substrate largely consists of large pieces of concrete, bricks, other construction debris, and some boulders. Several large shaded pools occur. Algae and anthropogenic debris are present throughout the site. Most of the shoreline is armored, consisting of vertical concrete debris/stone armoring or engineered walls constructed of tires and other man-made materials.

Ecological Value: The site provides habitat resources to animals largely adapted to an urban environment (e.g., squirrels, Norway rat, etc.). Fish habitat is significantly impacted by the presence sewage, garbage, concrete debris, and an upstream dam; although, at the time of preparation of this document, a fish ladder was being constructed. Once completed, the fish ladder could provide some improvement to the site's ecology as it would provide a route for anadromous fish and other species to traverse beyond the dam.

5.2.2 Site 861. Bronx Zoo and Dam

The landscape surrounding the Bronx Zoo and Dam site is generally flat and occupied with roadways, parking lots, and the installations of the Bronx Zoo. Within the site, the river's flow is affected by a system consisting of two (2) dams abreast of each other separated by a mid-stream island. A distinct sewage odor was encountered upon entering the water, downstream of East Fordham Road. It is assumed that both sewage sources and runoff from the Bronx Zoo are contributing sources. Moreover, the 2007 USACE study indicate that the Bronx County Zoo was also investigated by the New York State Office of Attorney General (OAG). In 2001, the Bronx Zoo agreed to implement a pollution abatement program and environmental benefit projects in response to the OAG investigation that revealed illegal discharges of both animal and human waste into the Bronx River. The extent of these

mitigation measures are unknown. Regardless, the presence of large animals and limited wetland buffer between the Zoo and open waters of the river likely results in some waste infiltration to the water.

Wetlands: Upstream of the dams, the majority of the observed wetlands are narrow strips of emergent vegetation along the banks of the river. However, in the northwest corner, an emergent wetland-mudflat complex dominated by jewelweed, loosestrife and water purslane has formed. In the southeastern portion of the site, a small stream drains into a flat, low area, resulting in a small forested/scrub/shrub wetland. Downstream of the dam, wetlands are very limited and consist of only very small (approximately 10 square feet), discontinuous pockets of emergent vegetation adjacent to the shoreline.

Uplands: Upstream of the dams, the uplands consist of lawns and a thin wooded strip along the shoreline. The wooded strip is impacted by heavy vine growth and dense patches of Japanese knotweed. Downstream of the dam, the upland areas are comprised of deciduous woodlands with an oak-tulip tree forest composition. On the west bank, the Zoo's amenities limit the width of these woods to fewer than 20 feet. In contrast, the woodlands extend for approximately 150 feet on the east side.

Stream Channel and Banks: In the northernmost portion of the site, the river is broader, at approximately 100-feet wide, and slower moving than other typical channel sections, and over five (5) feet deep in some locations. Just upstream of the dam, an upland island vegetated mostly by invasive species create splits the river into two (2) channels that rejoin between the two dams. The west bank of the upstream portion of the river is mostly armored and directly adjacent to a Zoo enclosure; the east bank is fairly steep and lightly vegetated with bare areas. Downstream of the dams, the narrower channel has a moderate flow with a rocky bottom and bank.

Ecological Value: The habitats of the site provide low to moderate fish and wildlife habitat. The habitats' small size and surrounding anthropogenic impacts limit their value.

5.2.3 Site 863. Stone Mill Dam

The Stone Mill Dam site, also called Snuff Mill Dam, is situated in a steep valley within the New York Botanical Garden (NYBG). The valley side slopes are over 40 percent grade with numerous rock outcrops. The presence of a dam divides the site into two (2) hydrologic regimes: a slow-flowing waterbody upstream of the dam and a swift-flowing waterbody downstream of the dam. A distinct sewage odor was encountered downwind of the dam. NYBG staff noted that samples from the Bronx River often contained high levels of coliform bacteria. In The 2007, a Microbial Source Tracking Study identified that pet wastes were recorded in high levels at locations above and below the NYBG. Also, human wastes were recorded at high levels upstream of the NYBG.

Wetlands: Wetlands at the site are practically non-existent and consist only of a few, very small (less than five (5) square feet), discontinuous pockets of emergent vegetation adjacent to the shoreline.

Uplands: Uplands consist of wooded slopes with large rock outcrops. Species observed included oaks, maples, alder, sassafras, and beech.

Stream Channel and Banks: Above the dam, the Bronx River is ponded and forms a large pool that is over four (4) feet deep; NYBG personnel indicated that the pool contains a thick sediment deposit. Below the dam, swifter flows occur and the river bottom consists of cobbles and boulders. Pools in excess of four (4) feet occur below the dam. Most of the shoreline and banks consist of bedrock and

boulders. At the southeast limits of the project, a stone and masonry retaining wall that separates a paved walkway from the shoreline has partially collapsed.

Ecological Value: Because of the extreme channel habitats, which include a sediment-laden pond and fast-moving rocky channel, and the dam, which is an obstacle for fish movement, the site provides low to moderate fish and wildlife habitat. The terrestrial habitats on site are used by species adapted for an urban environment. The woodlands on the slopes appear to be stable and do not appear to contribute to the sediment load.

5.2.4 Site 113. Shoelace Park

Shoelace Park is surrounded by dense, urban development. The west side of the site largely consists of the Bronx River Parkway’s roadway embankment. The eastern side of the site is parkland, predominantly consisting of maintained lawns that rise on a slope of notable steepness (approximately 25- to 30-percent grade) to roughly 60 feet in elevation from the river channel.

Wetlands: The wetlands on site are limited to very narrow, lightly vegetated strips of emergent vegetation along the banks. Jewelweed and creeping jenny were the dominant wetland species observed during the site visit. There are many areas of mudflat along the lower banks.

Uplands: Much of the uplands within the site consist of lawns associated with the Park. In the extreme northern and southern portions of the site, deciduous woodlots occur. Along the banks of the river, dense pockets of Japanese knotweed are present. In some areas, New York City Department of Parks and Recreation (NYC Parks) has removed or partially removed this invasive species; some of this removal work was observed during the site visit. Erosion gullies were frequently observed on the upland slope.

Stream Channel and Banks: In this site, the sandy-bottom channel is generally one (1) to three (3) feet deep with limited riffles and pools. The banks are nearly vertical in some locations and the faces of the banks are sparsely vegetated. During the site visit, previous attempts to stabilize the embankments with staking, erosion control fabric, and coir logs were observed. At several locations rock vanes are constructed in the river, presumably in an attempt to modify the flow regime.

Ecological Value: Due to the dense surrounding urban development, significant habitat fragmentation, sedimentation issues, and dense growth of invasive species, the site provides limited fish and wildlife habitat. Pedestrian access points to the river at several locations appear to act as conduits for upland sediment and debris to enter into the river.

5.2.5 Site 862. Muskrat Cove

The Muskrat Cove site is located just north of the Shoelace Park site, flowing through a small valley located between a Metro North commuter rail line and the Bronx River Parkway, and intersected by Webster Avenue. The majority of the terrestrial area of the site consists of wooded slopes dominated by deciduous species.

Wetlands: The wetlands on site are limited to very small isolated pockets. The wetlands are sparsely vegetated. Jewelweed and purple loosestrife were the dominant wetlands species observed during the site visit.

Uplands: The uplands consist of maintained lawns associated with the park and Bronx River Parkway right-of-way. Portions of the upland slopes were occupied by dense stands of Japanese knotweed. Paved walkways, retaining walls and other infrastructure fragment the woodlands.

Stream Channel and Banks: There were some riffles observed, however, the river is shallow and widened within limited pools. The river bottom is sandy with large boulders. Banks are armored throughout much of the site, including almost the entire western shoreline; in some areas vegetation has grown up through cracks in the armor. The eastern shoreline in the northern half of the site is not armored; banks are generally steep and some are undercut.

Ecological Value: Due to the past and ongoing disturbances at the site, small fragmented habitats, presence of invasive species, and armored banks, there exists limited fish and wildlife habitat value.

5.2.6 Site 851. Bronxville Lake

At this location, the Bronx River flows through a broad valley (approximately 400 feet wide), the sides of which are 20 to 40 feet high. The weir across the river at the southern end of the site creates a broad and shallow lake in the southern two-thirds (2/3) of the site. A park, part of the Bronx River Parkway Reservation maintained by the Westchester County Department of Parks, Recreation, and Conservation, surrounds the lake. The park consists largely of maintained lawns with trees, with several pockets of emergent wetlands that are landscaped and mowed. During the site visit, Canada geese (*Branta canadensis*) and their fecal matter were encountered throughout the site and an odor of sewage was encountered downwind of the weir.

Wetlands: Around the edge of the lake, the wetlands generally consist of a two (2)-foot wide strip, sparsely vegetated with emergent vegetation. The vegetation, where present, is dominated by loosestrife and jewelweed. On the western side of the lake, the wetlands extend to approximately five (5) feet in width for short distances. Within the lake, several sediment bars have formed with limited amounts of emergent vegetation. Interspersed in the uplands (i.e., mowed lawns), there are several small pockets of mowed wetlands in shallow depressions.

Uplands: The majority of the uplands at this site are maintained lawns with isolated trees located within the park and Bronx River Parkway right-of-way. Several small woodlots occur within the site, dominated by deciduous species. These lots are fragmented and provide limited habitat value.

Stream Channel and Banks: The broad, shallow lake in the southern portion of the site is subject to nutrient-enriched runoff from the park. Several drainage pipes that empty into the lake from the parkway and other upland areas were observed at the site. The shoreline in the northern portions of the site and the area in the south adjacent to the bridge are armored with large boulders. Around the lake, the short banks are generally vertical, with the upper bank predominantly lined with a single row of trees (e.g., alders, maples, etc.) that are impacted with heavy vine growth. To the north, the channel is narrower with steeper and higher banks.

Ecological Value: The site is a suburban park and would only support species common to a suburban environment. The lack of shaded cover, shallowness of the lake, and lack of submerged aquatic vegetation or in-stream cover limits the habitat value of the lake for aquatic species. The adjacent uplands and pocket wetlands appear to be regularly mowed, providing little ecological value.

5.2.7 Site 852. Crestwood Lake

Similar to Bronxville Lake, the Bronx River at the Crestwood Lake site flows through a broad valley (approximately 400 to 600 feet wide), the sides of which are approximately 20 feet in elevation. At the southern end, the river is dammed, forming a broad, shallow lake approximately three (3) times the width of the river upstream. On the west side of the lake is a confluence with a small tributary of moderate flow named Troublesome Creek. A walking trail and lawns with trees border the eastern side of the lake; woodlots and lawns bordering the northwest side of the lake are part of the Bronx River Parkway Reservation maintained by the Westchester County Department of Parks, Recreation, and Conservation. A portion of the southeast side of the project overlaps the Parkway Oval Recreation area, which is owned and maintained by the Town of Eastchester. Canada geese (*Branta canadensis*) and their fecal matter were encountered throughout the site.

Wetlands: Around the lake, the wetlands generally consist of a vegetated strip that varies in width from two (2) to 10 feet dominated by emergent vegetation (e.g. loosestrife, jewelweed, water purslane). Within the middle of the lake, several large, vegetated and mudflat sediment bars are present. The bars are densely covered with loosestrife, jewelweed, cattails, mallow, willows, alders and common reed.

Uplands: The majority of the uplands are maintained lawns with some single trees and woodlands dominated by deciduous trees (oaks, maples, sassafras, etc.) and shrubs common to southeastern New York State. The woodlots are not remnants of old growth forests, but secondary wooded areas similar to a maple-basswood rich mesophytic forest. The woodlots on either side seem provide a reasonable noise buffer from the adjacent parkway and rail line. In the northern portion of the site, the wetlands are bounded by a thin riparian strip vegetated with sweetgum, basswood, arrowwood, elderberry, and rose bushes. Several dense pockets of the invasive Japanese knotweed were observed during the site visit.

Stream Channel and Banks: The majority of the site is a broad and shallow lake habitat subject to nutrient enriched runoff from the lawns and potential upstream sources. In the northern portion of the site is a small reach of shady river channel with a rock and sand bottom. Armoring of the shoreline occurs in the extreme northern and southern ends adjacent to the roadway and pedestrian bridges, respectively. A vegetated sediment bar is present at the Troublesome Creek tributary confluence and several additional sediment bars, both vegetated and mudflat, are present within the lake.

Ecological Value: The site has moderate wildlife habitat value. The woodlots on site could provide habitat and/or serve as the home ranges for small- to medium-sized mammals (e.g., squirrels, raccoons, etc.), but their fragmentation and lack of interspersion with the wetlands limits their value. The lack of shaded cover, shallowness of the lake, and lack of submerged vegetation or in-stream cover limits the habitat value of the lake for aquatic species.

5.2.8 Site 853. Harney Road

The majority of the site is located north of Harney Road between the northbound and southbound lanes of the Bronx River Parkway. The eastern portion of the site is bounded by the parkway's northbound lanes. The southbound lanes cut through the western portion of the site. In general, the channel in this site is over-widened and shallow, with a ponded area upstream of the weir located immediately south of Harney Road bridge. A paved path and park on the east side of the river are part of the Bronx River Parkway Reservation maintained by the Westchester County Department of Parks, Recreation, and Conservation.

Wetlands: Along the water's edge, the wetlands are often less than two (2)-feet wide with some isolated pockets in excess of 10 feet in width. Vegetation consists of jewelweed, purple loosestrife, sedges, willow shrubs, and an isolated stand of cattails at the southeastern corner of the ponded area. Within the mowed lawn area west of the parkway, several emergent wetlands occur in digressional areas. These wetlands are also mowed.

Uplands: This site's upland landscape essentially consists of road embankment slopes. On the western side, the slopes are steep narrow between the channel and parkway, with a strip of lawn and some pockets of trees and shrubs. The eastern side is wider, with shallower slopes of maintained lawns and a strip of woodland adjacent to the parkway. On the eastern side of the site, just north of Harney Road, a buried storm drain is causing sediment deposition and minor erosion. West of the southbound lanes of the parkway, there is a large mowed lawn area with few single trees; as stated above, pockets of emergent wetlands are present within the lawn.

Stream Channel and Banks: North of Harney Road, the Bronx River is an over-widened, broad (approximately 60 feet wide), slow moving channel, with depths often less than two (2) feet. A single deep pool exists at the northern end, just below the Garth Woods site. The banks are generally vertical and show signs of moderate erosion. Dense growths of Japanese knotweed were also observed along the banks. Immediately south of Harney Road, the river flows over a four (4)-foot high weir, creating swifter flows and a semi-vegetated alluvial bar. Banks south of Harney Road are armored.

Ecological Value: The woodland area provides some value to small and mid-sized mammals adapted to suburban environments. However, no large rooted beds of vegetation were observed and, due to the broad and shallow channel and narrow wetlands, it is likely that the river in this section provides limited habitat value for fish.

5.2.9 Site 853. Garth Woods

The Garth Wood site consists of a large forested area, traversed by the Bronx River Parkway Reservation path on the east and bordered by the Bronx River on the west. Currently, most of the river flows immediately adjacent to the Bronx River Parkway embankment, but a remnant channel suggests that a previous channel location has been altered. The northbound lanes of the parkway and a pedestrian bridge intersect the channel in the northern end of the site. It appears that a Westchester County Sewer trunk line bisects the project area.

Wetlands: Wetlands consist of very thin strips along the eastern side of the channel that are very sparsely vegetated with emergent vegetation, as well as wet depressions within the adjacent forests, mostly within the remnant channel east and north of the river. The forested wetlands are dominated by emergent vegetation (skunk cabbage, jewelweed, cinnamon fern, and elm). During the site visit, evidence of likely vernal pools was also observed within the forested areas. There are no wetlands along the western shoreline along the parkway embankment.

Uplands: The majority of the uplands consist of deciduous forest characteristic in structure to that of a floodplain forest. Species include elms, sycamores, oaks and maples. Within the site's upland areas, areas of dense growths of Japanese knotweed were observed during the site visit, especially in the area of the remnant channel. Large sand deposits were also observed in the remnant channel, evidence of flows during storm events.

Stream Channel and Banks: In this reach, approximately three quarters (3/4) of the western bank of the river consist of the vertical embankment walls of the Bronx River Parkway. There is noticeable undercutting of the parkway embankment along the western edge. The remainder of the river's banks are abutted by a contiguous floodplain forest. The river contains numerous riffles and pools throughout its course with a benthic substrate of boulders and cobbles. The majority of the banks on the eastern side are low, steep, and sparsely vegetated; both boulders and tree roots provide moderate bank stability. Sediment deposits were observed in the northern portion of the channel during the site visit.

Ecological Value: The contiguous forested floodplain and the riffle pool complex of the river provides decent habitat value for both terrestrial and aquatic species.

5.2.10 Site 854. Westchester County Center

The Westchester County Center site is roughly bounded by the southbound lanes of the Bronx River Parkway to the west, the Metro North right-of-way to the east, and the Westchester County Center east parking lot to the south, with large tracts of maintained lawn with trees. The topography is generally flat with the Bronx River flowing through the middle of the site. The only notable change in elevation is along the eastern boundary of the site where the embankment for the rail line rises roughly 20 to 30 feet in elevation. The confluences of two (2) tributaries, Manhattan Brook and the Fulton Brook, occur within the site.

Wetlands: Within the site, wetlands are present as thin, sparsely vegetated strips, less than one (1) to two (2) feet wide of emergent vegetation along the banks, and as a few larger pockets of emergent species present along a gas line along the eastern boundary adjacent to the rail line. In the lower half of the site, along the western bank, larger pockets of emergent wetlands occur on a shelf that is of lower elevation than the surrounding uplands. This shelf appears to have been formed from alluvial deposition. The wetlands here are dominated by jewelweed and purple loosestrife, but also have dense growth of Japanese hops and other vines. Along the gas line, the wetlands are dominated by jewelweed, iris, purple loosestrife, path rush, and skunk cabbage, with pockets of common reed and some alder and elm.

Uplands: The majority of the uplands on site consist of flat, maintained park and right-of-way lawns with single or clustered trees. Adjacent to the banks, thick stands of Japanese Knotweed and numerous vines dominate. Along the easternmost portion of the site, a thin strip of woodlands occurs. The woodlands consist of maples, oaks, elms, and other common deciduous woodland species. Within these woodlands, there appear to be pockets of wetlands and potential vernal pool habitat.

Stream Channel and Banks: Within the site, the river has a moderate flow with a mostly sandy bottom. It is generally shallow with some intermittent deep pools. During the site visit, several mudflats and sparsely vegetated sediment deposits were observed; a large deposit, collecting some garbage and debris is located just north of the Fulton Brook. Sediment staining on vegetation, wrack lines, and other hydrologic indicators implies that this portion of the river is subject to strong and high flows during storm events. The river's vertical banks show sign of active erosion and are sparsely vegetated. Only the extreme southernmost portion and northern portion of the site have armored banks.

Ecological Value: The site provides low to moderate fish and wildlife habitat value, used primarily by species adapted for a suburban environment. The woodlands in the eastern portion of the site provide greater ecological value as they contain potential vernal pool habitat and buffer existing wetland

habitats. Sediment deposition and non-point source pollution from the two (2) tributaries appear to be negatively impacting the site's ecosystem.

5.2.11 Reference Site - Mianus River Gorge

The Mianus River Gorge is a mid-reach stream[4] that flows through a hilly region of southern New York State. The site's riparian corridor is wide (approximately 1000 feet) and wooded with little disturbance. Adjacent to most of the banks are flat floodplains consisting of emergent, scrub/shrub, and forested wetlands with some potential vernal pool habitat, with widths ranging between 10 and 30 feet. On either side of the stream and floodplain, wooded hills with slopes in excess of 20-percent are common. Seeps and ephemeral streams occur on the slopes of the hills.

Wetlands: Shrub/scrub and emergent wetlands are common along the riverbanks and within the floodplains. American elm, ash, red-osier dogwood, cinnamon fern, jewelweed, Pennsylvania knotweed, hydric grasses, trillium and water purslane were commonly observed during the site visit. Seeps are vegetated with dense growths of skunk cabbage. Evidence of vernal pools exists within the floodplains. In areas of higher banks, fringe wetlands exist in the upper shore zones, with mudflat along the lower banks.

Uplands: Uplands consist of mixed deciduous (oak, maple, beech) and hemlock forest. Shrubs and ground cover within the forest was limited, likely a result of deer browse.

Stream Channel and Banks: During the site visit, the river water was clear with a moderate flow. No evidence of debris, sewage or other pollutants was visible. The bottom of the river consists of a variety of substrates dominated by sand with some boulders and coarser sediments. Trees and snags overhang approximately 25 percent of the channel, which along with stable undercut banks, could contribute to quality fish habitat.

Ecological Value: The ecological value of the existing wetlands and adjacent forests is fairly high. During the site visit, limited environmental stressors (e.g., pollution, invasive species, etc.) were observed. Moreover, the wide, wooded riparian buffers and adjacent uplands further contribute to ecological value of the entire river valley. Numerous sightings of avifauna and wildlife occurred throughout the investigated area.

Chapter 6: Desktop Studies

6.1 Uniqueness and Heritage Elements

To support the EPW's Uniqueness/Heritage Function, BRFT personnel reviewed applicable databases, including the NYSDEC Environmental Resource Mapper, NYSDEC Freshwater wetland maps, cultural resource data bases (List of National Register-listed, National Register-eligible sites), List of National Wild and Scenic Rivers, and other appropriate reference documents (e.g., *Cultural Resources Baseline*

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[4] Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors), 2014, Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Study Bronx River Ecosystem Restoration Study, Westchester and Bronx Counties, New York[5] [Baseline Study], prepared by the USACE, New England District [NAE] - March 2007).

Cultural State Historic Preservation Office resources, including historic architectural and archaeological, are regulated under Section 106 of the National Historic Preservation Act (NHPA). In order to determine if known cultural resources were present on the sites, literature, past reports, and regulatory agencies' (i.e., [SHPO]) databases were queried. A number of known resources are present in close proximity to the sites; moreover, there is the potential for unknown resources to be present at the sites. A detailed list of these cultural resources is provided in Attachment F. During the site visits, no surface evidence was present to suggest the presence of buried archaeological resources in the project sites. Moreover, significant historic architectural resources were generally observed to be in locations that would not be directly impacted by future restoration efforts.

In compliance with Section 106 of NHPA and NEPA, each of the proposed restoration sites would need to be evaluated on a case-by-case basis for archaeological and historic architectural sensitivity based on the actions associated with the restoration techniques chosen to be implemented at each location. If eligible archaeological or historic architectural resources are encountered, recommendations would be made for avoiding such resources. The required studies to determine if these resources are present (e.g., Phase 1A investigations) are described in detail in Attachment F. If the eligible resources cannot be avoided, then mitigation measures would be suggested. Mitigation could require the relocation, preservation in place and/or augmentation of project plans to reduce the direct or indirect impact on a resource.

In USACE's baseline study, it was noted should impacts occur to National Register Listed or Eligible sites, a Memorandum of Agreement will be developed by the USACE in consultation with the SHPO, the Advisory Council on Historic Preservation, and other interested parties.

Except for the Mianus River Gorge reference site, all of the sites had previous and ongoing disturbances due to a variety of anthropogenic perturbations (e.g., channelizing river reaches, placement of CSOs, maintain habitats through mowing, etc.). Due to the degree of disturbance, it is unlikely that protected species or critical habitats to support these species would occur in the project sites. Further details on the endangered species information for the sites are provided in Attachment F.

A request letter was sent to the New York Natural Heritage Program (NYNHP) for known occurrences of threatened and endangered species within or near the project sites. Based on the correspondence with NYNHP (see Attachment F), there are not recent records of threatened and endangered species at the project sites.

6.2 Water Quality Classifications

All waters in New York State are assigned a letter classification that denotes their best uses. Letter classes such as A, B, C, and D are assigned to fresh surface waters. As shown in Table 6-1, review of the NYSDEC Enviromapper[6] indicated that the sites in the Bronx were classified as "B" and the sites in

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[5] Atwood, Kathleen A.,Marcos A. Paiva, and Saji Varghese,U.S. Army Corps of Engineers, New England District, 2007, Cultural Resources Baseline Study, Bronx River Ecosystem Restoration Study, Westchester and Bronx Counties, New York.

[6] http://www.dec.ny.gov/imsmaps/ERM/viewer.htm

Westchester were classified as “C”. Class B waterbodies are regarding as having a higher water quality than class C waterbodies; however, for some of the sites in the lower reaches of the watershed, a strong sewage smell was observed indicating the presence of sanitary sewer outflows and/or CSOs. Note that the portion of the Bronx River near Westchester County Center site is a classified as a trout stream, but it was not evaluated as such for the EPW Water Quality Function due to existing conditions. The Mianus River Gorge reference site is classified as Class AA-S, one of the highest quality waterbodies with few to no pollutants, low levels of nutrients, and no alteration to flow that will impair the waters.

Table 6-1: NYSDEC Water Quality Classifications for Project Sites

Site	Water Quality Classification
River Park/West Farm Rapids Park	B
Bronx Zoo	B
Stone Mill Dam	B
Shoelace Park	B
Muskrat Cove	B
Bronxville Lake	C
Crestwood Lake	C
Harney Road	C
Garth Woods	C
Westchester County Center	C (T) classified trout stream
Reference Site – Mianus River Gorge	AA-S
Best Usages (from NYSDEC):The best usages of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival. The best usage of Class C waters is fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes. The best usages of Class AA-S waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish, shellfish, and wildlife propagation and survival.	

Chapter 7: Evaluation for Planned Wetlands (EPW)

7.1 EPW Process

EPW was conducted as described in Section 2.1.1 of the main Appendix.

7.2 Considerations for EPW for the Bronx River

7.2.1 Wetland Areas

As per the EPW handbook, for each element, there are certain rationale and assumptions that need to be considered during the assessment procedure. In general, the typical metrics (e.g. contact once annually or less, slope <10:1, etc.) in the handbook and on field data sheets were followed. However, there were a few elements for which the condition assessment metric given on the field data sheet was

not applicable to this project. For these instances, the field team selected more appropriate condition assessments on which to base the EPW scoring. These include:

- 10. Vegetation Characteristics during Growing Season (note differences in definitions for upper shore zone, lower shore zone, and entire wetland) – Due to the fact that the wetlands assessed at most sites were very narrow and in most cases, quite steep (2:1 or steeper), an assumption was made for the evaluation of the 'lower" and 'upper' shore zones. The 'lower shore zone' was designated as the portion of the bank that was typically wetted and/or saturated under normal water level conditions; the 'upper shore zone' was designated as the higher portion of the bank that was rarely inundated but could still support wetland vegetation and/or exhibit signs of wetland hydrology.
- 11a. Number of Layer in Banks – Determination was made to include 'water column, open water below 25cm (10in) in depth' in the wetland layers only at sites where the water flow did not prohibit the growth of hydrophytic vascular vegetation.
- 14a. Steepness of Existing Shore & 14b Steepness of Planned Wetland Shore – For these project sites, the potential for shoreline stabilization is not based upon whether or not existing conditions would allow for the construction of a shallow-sloped wetland, but rather whether or not existing infrastructure would prevent shoreline improvements. Therefore, the field team applied the metric "Constructible" and "Not Constructible" in lieu of specific slope ratios.
- 27a. Spawning Substrate, Accessible during Spawning Periods – Assumed substrate dominated by large, anthropogenic construction debris (e.g. bricks, concrete blocks, etc.) fell under choice 'c. Boulders, bedrock or fines (e.g., silt, mud, clay).'

7.2.2 Upland Areas

Although it is recognized that EPW was developed for assessing the functionality of wetland areas, due to the need to account for adjacent upland areas that needed to be incorporated into the project designs, the project delivery team (PDT) applied EPW functional assessment methodology to assess the adjacent uplands. The PDT determined that field data sheets for three (3) of the EPW functions could be modified slightly for the assessment: Shoreline Bank Erosion Control, Sediment Stabilization, and Wildlife. General modifications consisted of considering the upland areas as opposed to wetland areas (e.g. wetland, shore zone, shorelines, etc.) for each element. In addition, specific unrelated elements were deleted from each of the three (3) sheets:

- Shoreline Bank Erosion Control (Upland) – deleted elements 1a, 2, 3, 6, 9, 10a, 10g, & 14b; for 14a Steepness of Existing Shore & 14b Steepness of Planned Wetland Shore – utilized <=3:1 for slope gradual and >3:1 for slope steep. Therefore utilized Influences on Rate of Erosion (I) for Shoreline Bank Erosion Control FCI.
- Sediment Stabilization (Upland) – deleted element 7.
- Wildlife (Upland) – deleted elements 13a & 13b.

The calculation sheets for these elements were also revised to reflect the above modifications.

7.3 EPW Results

Below are summary tables of the EPW FCIs and FCUs for the 10 sites and one (1) associated reference site. Table 7-1 represents the existing FCI for each EPW function, and Table 7-2 represents the FCI for each EPW Upland function. The existing FCI and FCU scores are found in Table A1 for each site in Attachment A.

Table 7-1: EPW Comparative Table Existing Functional Capacity Indices (FCIs)

Site	Shoreline Bank Erosion Control	Sediment Stabilization	Water Quality	Wildlife	Fish (Stream /River)	Uniqueness / Heritage
Site 860. River Park/West Farm Rapids Park	0.7[*]	0.5[**]	0.4[+]	0.1	0.3	1.0
Site 861. Bronx Zoo and Dam	0.4	0.6[**]	0.4[+]	0.2	0.4	1.0
Site 863. Stone Mill Dam	0.8[*]	0.6[**]	0.4[+]	0.1	0.4	1.0
Site 113. Shoelace Park	0.3	0.2	0.3	0.1	0.4	1.0
Site 863. Muskrat Cove	0.5	0.5[**]	0.3	0.1	0.4	1.0
Site 851. Bronxville Lake	0.5	0.5[**]	0.5[+]	0.2	0.4	1.0
Site 852. Crestwood Lake	0.9[*]	0.6[**]	0.5[+]	0.3	0.4	1.0
Site 853. Harney Road	0.6[*]	0.1	0.3	0.2	0.4	1.0
Site 853. Garth Woods	0.5	0.1	0.4[+]	0.2	0.4	1.0
Site 854. Westchester County Center	0.5	0.1	0.3	0.2	0.5	1.0
Reference Site – Mianus River Gorge	0.6	0.4	0.4	0.5	0.6	1.0

[*] *For the Shoreline Bank Erosion Control FCI, the inherent stability of the existing concrete walls, armored banks and/or bedrock/boulder slopes at the River Park/West Farm Rapids Park, Stone Mill Dam, and Garth Woods sites increased the EPW scores when compared to the natural mud shorelines of the reference site. Crestwood Lake scored higher than the reference site for this FCI as the pond's shorelines have limited erosion, except for areas with riprap shoreline stabilization. However, it should be noted that the reference site's overall ecological function was substantially superior to these four (4) Bronx River project sites.*

[**] *For the Sediment Stabilization FCI, existing concrete walls, armored banks and/or bedrock/boulder slopes at the River Park/West Farm Rapids Park, Stone Mill Dam, and Garth Woods sites increased the EPW scores when compared to the natural mud shorelines of the reference site. Bronxville Lake and Crestwood Lake scored higher than the reference site because of the larger amount of wetland vegetation coverage that exists across their 'wetted' areas of shoreline, as well as the lack of water level fluctuation. However, it should be noted that the reference site's overall ecological function was substantially superior to these five (5) Bronx River project sites.*

[+] *For the Water Quality FCI, the reference site, while showing signs of a higher level of overall water quality, scored similar or slightly less than six (6) Bronx River project sites. This is likely due to the act that the metrics under this FCI focus on wetland functions that impact water quality (i.e. vegetation coverage, little to no disturbance along the shoreline, undercut banks, stable shoreline even if armored, etc.) and do not factor in anthropogenic inputs/impacts. Furthermore, a typical water quality indicator for streams is fish habitat, which is measured as a separate FCI under EPW.*

Table 7-2: EPW Comparative Table Existing FCIs (Uplands)

Site	Shoreline Bank Erosion Control (Upland)	Sediment Stabilization (Upland)	Wildlife (Upland)
Site 860. River Park/West Farm Rapids Park	0.3	0.2	0.2
Site 861. Bronx Zoo and Dam	0.4	0.4	0.4
Site 863. Stone Mill Dam	0.5	0.8	0.6
Site 113. Shoelace Park	0.5	0.3	0.2
Site 863. Muskrat Cove	0.8	0.9	0.3
Site 851. Bronxville Lake	0.6	0.5	0.2
Site 852. Crestwood Lake	0.5	0.7	0.3
Site 853. Harney Road	0.6	0.7	0.2
Site 853. Garth Woods	0.5	0.7	0.6
Site 854. Westchester County Center	0.6	0.7	0.3
Reference Site – Mianus River Gorge	0.2	0.8	0.4

In general, the traditional wetland-related FCI scores for the sites were similar for most functions, including Water Quality, Wildlife, Fish, and Uniqueness/Heritage. The extremely lower scores for the Wildlife function are likely due to the narrowness and small areas of the wetlands on the sites, as well as sparse vegetation and low cover type interspersion. The mid-level scores for the Water Quality and Fish functions are likely due to impacts from limiting factors like water level fluctuations and site disturbances, as well as lack of fish habitat. The uniqueness/heritage function high score across the board is due to the fact that all of the sites are associated with public parks. For the other two functions, Shoreline Bank Erosion Control and Sediment Stabilization, scores varied more across the sites; this is due to various levels of stability of the banks and adjacent areas. For these two functions, the Stone Mill Dam and Crestwood Lake sites scored highest.

Mianus River Gorge, the reference site, did score higher than average across all categories, but its mid-range scores do indicate some stresses, likely due to impacts from upstream development. When compared to the 10 sites, the BRFT believes these mid-range scores demonstrate the site to be a good 'reference' as opposed to a site with closer to 1.0 scores across the board. Instead of designing restoration plans to meet all the characteristics of a healthy, natural, unimpacted river, focusing on restoration measures that would achieve similar functionality and/or mimic the reference site conditions would the USACE's restoration intent, as well as meet the Bronx River Alliance's objective '…to increase the number and length of river reaches which meet the conditions of an ecologically functional river in order to create a system that is sustainable and resilient and that possesses desired ecosystem conditions."

For the three (3) modified upland functions, Erosion Control, Sediment Stabilization, and Wildlife, the scores varied more across the sites than the wetland scores. This is expected based on the varied upland buffer conditions, sizes, habitats, and anthropogenic stresses on the sites. Both based on the results and observations made during the field investigations, it should be noted that the modified

upland sheets are not the most accurate depiction of the health of the upland buffers as they were originally intended as, so many of the elements were not applicable to be scored. Other factors of upland functionality and support to the adjacent wetland ecosystems will be factored into future decision-making based on the overall habitat mapping and general best professional judgement.

The Mianus River Gorge site scored low on the Upland Erosion Control function and only mid-range for the Upland Wildlife function; these are really not an accurate assessment of the existing functionality of the upland buffer at this site as it is quite stable and showed many signs of wildlife inhabitants. The lower scores appear to be a result of the dominance of forested species in these mature woodlands, bringing down the overall scores because of a lack of multiple cover types and their associated interspersion, which formed most of the scoring basis for these two upland functions.

Table 7-3 represents the existing FCUs for each EPW function, and Table 7-4 represents the existing FCUs for each EPW Upland functions.

Table 7-3: EPW Comparative Table Existing FCUs

Site	Shoreline Bank Erosion Control	Sediment Stabilization	Water Quality	Wildlife	Fish (Stream/ River)	Uniqueness/ Heritage
Site 860. River Park/West Farm Rapids Park	0.002	0.0016	0.0011	0.0003	0.0008	N/A
Site 861. Bronx Zoo and Dam	0.15	0.27	0.15	0.09	0.16	N/A
Site 863. Stone Mill Dam	0	0	0	0	0	N/A
Site 113. Shoelace Park	0.006	0.003	0.006	0.003	0.007	N/A
Site 863. Muskrat Cove	0.01	0.01	0.01	0.002	0.01	N/A
Site 851. Bronxville Lake	0.16	0.16	0.15	0.07	0.13	N/A
Site 852. Crestwood Lake	1.70	1.13	1.09	0.70	0.72	N/A
Site 853. Harney Road	0.33	0.07	0.17	0.10	0.26	N/A
Site 853. Garth Woods	0.09	0.02	0.09	0.05	0.07	N/A
Site 854. Westchester County Center	1.1	0.3	0.6	0.3	0.9	N/A
Reference Site – Mianus River Gorge	2.23	1.30	1.52	1.97	2.31	N/A

Table 7-4: EPW Comparative Table Existing FCUs (Uplands)

Site	Shoreline Bank Erosion Control (Upland)	Sediment Stabilization (Upland)	Wildlife (Upland)
Site 860. River Park/West Farm Rapids Park	1.86	0.29	0.32
Site 861. Bronx Zoo and Dam	1.60	1.84	1.56
Site 863. Stone Mill Dam	0.38	0.59	0.42
Site 113. Shoelace Park	15.02	7.51	6.14
Site 863. Muskrat Cove	3.83	4.46	1.50
Site 851. Bronxville Lake	5.60	4.14	1.75
Site 852. Crestwood Lake	7.79	10.45	4.38
Site 853. Harney Road	4.31	4.74	1.21
Site 853. Garth Woods	2.99	4.19	3.29
Site 854. Westchester County Center	12.56	13.82	5.34
Reference Site – Mianus River Gorge	3.44	12.06	6.80

The FCU scores for each site varied based on their wetland and upland acreages; these scores will be the basis for decision-making in the alternatives development for the planned wetlands.

Chapter 8: Stream Visual Assessment Protocol (SVAP)

8.1 Stream Visual Assessment Protocol (SVAP) Process

The BRFT utilized the SVAP to assess hydrologic and morphologic stream conditions that were not addressed within the scope of the EPW. SVAP is a qualitative field reconnaissance technique that assesses channel and floodplain conditions, riparian areas, water quality and aquatic habitat developed by NRCS in 1998. It was developed to work as an assessment for existing physical conditions within a project site; it may not detect factors affecting the location from the watershed or stream reaches outside of the project limits.

During a site assessment, the SVAP is recorded on a standard two (2) page worksheet. Following the SVAP guidelines for recording, up to 15 assessment categories, such as channel, bank stability, riparian zone conditions, and in-stream fish cover, may be scored in a range from one (1) to 10. Depending on the existing site conditions, not all elements may need to be recorded. The overall assessment score is created by adding up the scored value for each element and dividing that by the number of the categories assessed. Any overall assessment score under six (6) is determined to be poor and any score over none (9) is excellent. This numerical score can be used as a general determination of the overall quality of the stream condition.

8.2 SVAP Results

Table 8-1 depicts the existing numerical scores for applicable assessment categories for each of the 10 sites and the reference site.

Table 8-1: SVAP Scores of Existing Conditions

Sites	Channel Condition	Hydrologic Alteration	Riparian Zone	Bank Stability	Water Appearance	Nutrient Enrichment	Barriers to Fish Movement	In-stream Fish Cover	Pools	Invertebrate Habitat	Canopy Cover	Manure Presence	Riffle Embeddedness	Total
Site 860. River Park/West Farm Rapids Park	3	1	1	10	7	5	1	3	7	3	5	N/A	5	**4.3**
Site 861. Bronx Zoo and Dam	7	1	5	7	7	7	1	3	3	3	1	1	5	**3.9**
Site 863. Stone Mill Dam	8	1	8	7	8	8	1	5	7	N/A	10	N/A	5	**6.2**
Site 113. Shoelace Park	3	3	5	3	7	8	8	5	3	5	5	N/A	3	**4.8**
Site 863. Muskrat Cove	1	4	8	1	9	9	10	5	4	6	7	N/A	7	**5.9**
Site 851. Bronxville Lake	1	3	1	5	7	5	5	1	2	3	1	1	3	**2.9**
Site 852. Crestwood Lake	7	3	5	5	7	7	1	3	2	3	1	1	N/A	**3.8**
Site 853. Garth Woods	5	3	5	7	8	10	3	5	7	7	10	N/A	8	**6.5**
Site 853. Harney Road	3	1	7	7	7	8	1	3	3	3	1	N/A	N/A	**4.0**
Site 854. Westchester County Center	5	5	8	5	7	7	10	5	3	3	10	N/A	3	**5.9**
Reference Site. Mianus River Gorge	10	10	10	7	9	10	10	8	7	7	10	N/A	5	**8.6**

In general, those sites with less impact to the natural stream geomorphology, mostly due to greater proximity from infrastructure and/or lack of human disturbance, scored higher. In addition, another large influence on the SVAP scoring was the amount of development within the adjacent riparian and upland areas; less developed areas with wider riparian buffers and uplands scored higher. All but two of the sites, Garth Woods and Stone Mill, scored below the SVAP poor threshold of 6, with the Westchester County Site scored close to 6, at a 5.9. The 'poor' scores are expected based on the urban setting and degraded nature of the streams. Remnants of some natural stream geomorphology and excellent canopy cover, coupled with the clear water and lack of nutrient enrichment at the Garth Woods and Stone Mill Dam sites lead to their higher scores. The Bronxville Lake and Crestwood Lake sites scored the lowest, as the waterbodies are largely functioning as a ponded system as opposed to a flowing system. The Westchester County Site scored higher based on its wider riparian zone, lack of barriers to fish movement, and excellent canopy cover. The reference site scored just below the SVAP excellent threshold of 9, which is expected as while its ecosystem is functioning well, there have been some impacts to the stream due to upstream development.

Chapter 9: Proposed Alternatives

The design alternatives proposed are presented as three (3) different alternatives, differing in functionality and ecological benefits. If a site had the potential for multiple design approaches (e.g. establishment of different upland and/or wetland habitat types, multiple reroute locations of the stream, varying locations for wetland establishment), the existing HRE conceptual plan for each site was considered as one design alternative and two (2) additional conceptual plan alternatives were developed for the site. If a single design approach was the most appropriate for a site, but different applications of the approach provided for comparably different results and ecological lift, the existing HRE conceptual plan was utilized as the basis to develop three (3) conceptual plan alternatives for the site by applying different variances of restoration measures. Examples of variances in measures include: a) type of bank stabilization structures (e.g. hard structure vs bioengineering vs plantings, b) acreage of invasive species removal or wetland creation or c) number of in-stream structures installed.

The restoration measures proposed for the site alternatives are based off TECs presented in Section 2.2 of the Appendix.

Table 9-1 categorizes and explains each restoration measure and techniques proposed for the Bronx River sites. Alternatives for each site were proposed and discussed at design charrettes for Bronx County Sites with NYCDEP and Bronx River Alliance (January 2015) and Westchester County Sties with Westchester County Department of Planning (February 2015).

Table 9-1: Ecological Restoration Measures

TEC	Measure	Description	Techniques
Wetlands (Coastal Wetlands)	Emergent Wetland Creation	Excavating and filling areas to create an emergent wetland to replace upland invasive areas to provide a habitat that is less likely to become revegetated with the same upland invasive species.	
	Forested and/or Scrub/Shrub Wetland Creation	Excavating and filling areas to create a forested and/or scrub/shrub wetland to provide continuous fringe habitat around and shade for fish habitat (from trees/shrubs).	
	Invasive Species Removal with Native Plantings	Removal of non-native plants and replanting those areas with plants native to the ecosystem. Invasive species removal will be in coordination with other ecological restoration measures	
Shorelines and Shallows	Shoreline Softening	The removal of existing structures and armoring and creating a living shoreline to protect against erosion and to provide and preserve natural habitat.	• Stacked Rock Wall w-Brush Layers • Select Rock/Concrete Removal w- Native Materials • Drilling w-Native Plantings
	Bank Stabilization	Establishing and implementing measures to prevent and/or fix erosion and stabilize the embankment.	• Stacked Rock Wall w-Brush Layers •Tiered Rock Slope w-Native Plant Benches/Pockets • Vegetated Crib Wall
	Riparian Buffer	Establishing and implementing measures to prevent and/or fix erosion and stabilize the embankment.	• Invasive Species Removal with Native Plantings • Select Native Planting
Fish, Shellfish and Benthic Habitat & Sediment Control/Nutrient Load Reduction [Habitat for Fish, Crab, & Lobsters]	Realign Channel w-Instream Structures	Changing the realignment of the channel and utilizing instream structures to modify the channel's hydrologic and hydraulic characteristics.	• Cross Vane • Skewed Cross Vane • J-Hook
	Channel Plug w-Select Native Plantings (Realign Channel w-Instream Structures)	Block water from entering the secondary channel to create a more adequate stream morphology in the main channel section.	
	Channel Modification w-Instream Structures	Modifications within the channel to steer, direct, and/or control the channel away from a specific area. The channel will remain within its current banks, but that sinuosity/more stable geometry will be achieved with the structures.	• Cross Vane • Skewed Cross Vane • J-Hook
	Bed Restoration	Modifications to the channel bed to create a low flow channel.	• Thalweg Restoration • Bed Material Replacement • Creation of Riffle-Pool Complex
	Debris Removal	The removal of substantial debris within the channel.	
	Sediment Dredging	Dredging od sediment laden areas within the channel to fix the hydraulic characteristics within the channel.	
	Forebay/Sediment Basin	Creation of forebay/sediment basin to capture sediment laden water and reduce the amount of sediment from settling in the channel.	
	Sediment Load Reduction	The reduction of sediment erosion in specified location.	• Vegetated Swale • Outlet Protection • Culvert Repair • Sediment Trap • Bioretention Basin/Raingarden
Tributary Connections	Fish Ladders	A structure that allows fish to migrate around obstacles like damns.	
	Weir Modification (Fish Passage)	Modifying the existing weir to create modifications to the hydraulic characteristics of the weir.	
Habitat Connections [Trib Connections]	Bench w-Viewshed	The addition of a bench with a viewing area.	
	Wildlife View Platform/Designated Area	The addition of a wildlife viewing platform for public.	
Public Access	Boat/Water Access	Creating a boat/water access for the public to access the water.	
	Proposed Path	Realignment of the existing path to avoid proposed restoration measures.	
	Educational Signage	Addition of education signage for public use.	

Shore softening is the removal of concrete, rock or debris and/or the addition of vegetation to an armored shoreline. Bank stabilization is a natural bank shoreline with no wetlands. It is assumed that restoration measures will include site specific enhancements that could increase various fish habitat and irregularity of stream bank. As part of shoreline softening and bank stabilization measures, wetland plants will be proposed at elevations near the ordinary high water make, with the intent of creating a narrow fringe wetland habitat at the site. Shoreline softening techniques include stacked rock wall with brush layers, select rock/concrete removal with native plant materials, and drilling w native plant materials. Bank stabilization techniques include stacked rock wall with brush layers, tired rock slope with native plant benches and pockets, and vegetated crib walls.

Instream structures that are associated with channel realignment and channel modification include cross vanes, skewed cross vanes, and j-hooks. The instream structures proposed should have little to no maintenance needed to maintain their functionality. One exception may be removal of fallen trees or large debris following major storm events.

Bed restoration techniques include thalweg restoration, bed material replacement, and creation of riffle-pool complex. The sediment load reduction ecosystem restoration measure includes techniques such as vegetated swales, outlet protection, culvert replacement, sediment trap and bioretention/raingardens. Benches, wildlife view platform/designated area, boat/water access, proposed path, and education signage are all possible proposed public access techniques.

Invasive species were identified by the BRFT at every site during field investigations. For all alternatives in any areas where existing invasive species were found, any measure that is proposed for that area will include the removal of invasive species. The alternative maps show ecological restoration measures such as shoreline softening and bank stabilization in areas where existing invasive species were observed. The implementation of these measures will include the removal of invasive species if present in the proposed measures locations. Based on the Planting Plan for Mamaroneck River Habitat Improvement provided by Westchester County, some large trees and wetland seed mix will be proposed for some sites. In the future, for or all of the sites, an invasive species survey will need to be conducted before implementation of restoration measures at the site. The existing invasive species may change in the future and will need to be surveyed and accounted for before any site restoration measures are implemented. A tree survey should also be conducted at all of the sites in the future prior to any implementation of site restoration measures to account for type, size, and location of existing trees.

Proposed plantings within the Bronx River will take historic aesthetic of the Bronx River Parkway into consideration. Plant height for proposed plantings will be maintained for the purpose of the historic viewshed. Existing plants however, will not be replaced for the purpose of improving the viewshed. The Historic American Engineering Record for the Bronx River Parkway was used as a reference for the design goals and principles used to create the parkway and the surround landscape as well as the viewsheds.

Restoration measures will follow floodway regulations as stated in FEMA’s CFR 44 Chapter 60.3 regarding no net rise in floodway elevations. Restoration measures will take into consideration cut/fill requirements per site. Once the feasibility level drawings are prepared, a more detailed cut/fill analyses will be completed to address potential flood inducement constraints per site.

As mentioned previously, for each site three alternatives were selected. The Alternatives A, B and C, generally vary in amount (e.g., acreage, linear feet, etc.) of restoration efforts. Alternative A provides the most restoration activities, with Alternatives B and C, providing lesser restoration actions, respectively. Regardless of the amount of restoration provided, each alternative was targeted to address the major environmental stressors on each site. At a regional level these, these alternatives were also considered to work in concert with each other (e.g., the providing of fish passages at each dam, etc.) to provide synergistic benefits that improve the TECs and provide a net ecological uplift to the entire Bronx River ecosystem.

9.1 Site 860. River Park/West Farm Rapids Park

The River Park/West Farm Rapids Park site is located within a densely populated, urban area and is approximately 900 feet in length, bisected by 180th Street. The site is substantially affected by anthropogenic pressures. Uplands within the site consist of developed areas, an urban park, and woodlands. The woodlands are fragmented and offer limited, if any, habitat resources to organisms not adapted for an urban environment. The site's uplands are further impaired by garbage and stormwater runoff. Wetland resources on the site are extremely limited, occurring in a few very small pockets and sparsely vegetated.

Most of the shoreline of the river is armored, the armor consisting of vertical concrete debris/stone armoring or engineered walls constructed of tires and other man-made materials. Within the site, the river's benthic substrate largely consists of large pieces of concrete, bricks, other construction debris, and some boulders. Algae and anthropogenic debris are present throughout the river bed. Several large shaded pools occur and riffles are present on the north end of the site, immediately downstream of the dam. A fish ladder was recently constructed in 2015 to link the river upstream of the dam with the river on the River Park/West Farm Rapids Park site, downstream of the dam.

The site provides habitat resources to animals that are largely adapted to an urban environment. Fish habitat is significantly impacted by the presence sewage, garbage, concrete debris, and an upstream dam. The fish ladder would provide improvement to the site's ecology as it would create a route for anadromous fish and other species to traverse across the dam an access upstream habitats. The three (3) alternatives designed for the River Park/West Farm Rapids Park site focus on ecological restoration of the site's terrestrial habitat, wetland habitat and/or aquatic habitat improvements as well as water quality improvement. Natural stream morphology restoration was an important ecological restoration component that was incorporated into each alternative for the site.

The environmental stressors are identified as:

- Limited wetlands on site;
- Considerable anthropogenic impacts (e.g., sewage, debris, etc.); and
- Engineered channel, man-made banks of constructed of debris (e.g., tires, concrete, etc.).

Located in a dense urban environment, improvement of the site would provide immediate environmental improvements that would provide benefits to a local population that has limited immediate opportunities to experience natural habitats. Moreover, due the prevalence of urban inputs (e.g., outfalls, high density development, etc.) environmental restoration would realize aesthetic, flood control, water quality, and potentially health benefits to the local population.. Moreover, the dam located on site is one of the tallest on the Bronx River and the implementation of ecological improvements, especially those for aquatic fauna (e.g., instream structures, bed restoration, debris removal, etc.) will therefore result in positive effects on aquatic fauna and overall water quality. North of the dam, the

shorelines of the Bronx River become less developed. The addition of the fish passage at this location, as well as the implementation of other fish ladders on the Bronx River could conceivable allow anadromous fish to once again swim from the mouth to the head of the river. The fish ladder will open approximately 44,163 linear feet of the Bronx River up for anadromous and catadromous fish.

9.1.1 Alternative A

Alternative A entails planting a woodland area along the west side of the River Park/West Farm Rapids Park site, between the dam and 180th Street, with native, upland trees and shrubs. Shoreline softening with boulders and facultative plants and emergent wetland creation will be employed along the adjacent east bank of the river, and the river channel will be modified for 0.03 miles using instream cross vanes and J-hooks. Downstream of 180th Street, invasive vegetation will be removed, and native upland shrubs and herbaceous vegetation will be planted upslope from both banks of the river. In this same river segment, the shoreline will also be softened using stacked rock walls with brush layers along the east bank, and by drilling with native plant materials along the west bank. Debris will be removed from a 0.07 mile stretch of the river bottom throughout most of the river segment downstream of 180th Street. The river channel will be realigned using instream cross vanes and J-hooks within a small section of the segment, and a larger section of the river bed will be restored by excavating the substrate and replacing it with bedding stone. An additional restoration measure will comprise improving public access to the river. Alternative A provides the greatest ecological uplift of the three (3) alternatives.

9.1.2 Alternative B

The restoration measures included in Alternative A also are included in Alternative B, with exception of channel modification with instream structures. Where Alternative A employs channel modification between the dam and 180th Street, Alternative B employs bed restoration. The extent of removal of debris from the river bottom is reduced in Alternative B. Alternative B provides ecological uplift intermediate between the uplift created by Alternatives A and C.

9.1.3 Alternative C

Relative to Alternative B, Alternative C eliminates bed restoration, shoreline softening with boulders and emergent wetland plants, and emergent wetland creation from the river segment between the dam and 180th Street. The extent of shoreline softening in the segment downstream of 180th Street is substantially reduced in Alternative C, and only occurs along the east bank, close to the downstream end of the River Park/West Farm Rapids Park site. Alternative C provides the least ecological uplift of the three (3) alternatives.

9.2 Site 861. Bronx Zoo and Dam

The Bronx Zoo and Dam site is an over-widened channel that experiences stagnation and constricted flow. Within the Bronx Zoo and Dam site, the river flow is affected by a dam system consisting of two (2) dams abreast of each other, separated by a mid-stream island. The site has a specific spot on the Mitsubishi path on the east bank that discharges salt water into the river, especially during the spring melt. Upstream of the dams, the majority of the wetlands consist of narrow strips of emergent vegetation along the banks of the river. Downstream of the dam, wetlands are limited and consist of very small (approximately 10 square feet) discontinuous pockets of emergent vegetation adjacent to the shoreline.

Upstream of the dams, the uplands consist of lawns and a thin wooded strip along the shoreline that is impacted by heavy vine growth and dense patches of Japanese knotweed. Downstream of the dams, the upland areas comprise deciduous woodlands that, on the west bank, are limited to a width of fewer than 20 feet, whereas the woodlands extend for approximately 150 feet on the east side.

Just upstream of the dams, an upland island, vegetated mostly by invasive species, splits the river into two (2) channels that rejoin between the two (2) dams. The west bank of the upstream portion of the river is mostly armored and directly adjacent to a zoo enclosure; the east bank is fairly steep and lightly vegetated, with bare areas.

This site provides low to moderate fish and wildlife habitats as their small size and anthropogenic impacts limit the value of these habitats. The three (3) alternatives that were designed for the site focus on several ecological uplifts including sediment load reduction on the east bank and restoring the channel flow. The alternatives also focus on terrestrial habitat, wetland habitat and/or aquatic habitat improvements, water quality improvements, and habitat connection.

The environmental stressors are identified as:

- Invasive species;
- Nutrient inputs from the zoo;
- Limited wetlands;
- Poor aquatic habitat upstream of the dam; and
- Barrier to fish movement.

Upstream of the dam, the waterbody is broad and shallow with nutrient-laden inputs from the zoo. The dams at the Bronx Zoo present a barrier to fish movements. Removal of these stressors would result in immediate improvements to water quality and would allow for fish, especially anadromous and catadromous species to access greater portions of the Bronx River.

9.2.1 Alternative A

Alternative A entails removing approximately 0.27 acres of invasive vegetation along both banks and on the upland island upstream of the dams, and planting native vegetation in these locations, as well as at an additional location downstream of the dams. In an area between the island and the west bank, the river bottom will be excavated and the bed material will be replaced. A section of approximately 415 linear feet of the west bank will be softened by select removal of the existing armor and planting with native species. A fish ladder (approximately 0.04 acres) will be installed to link the excavated channel area upstream of the dams to the river channel below the dams. The fish ladder will open approximately 3,373 linear feet of the Bronx River up for anadromous and catadromous fish. Emergent wetlands of approximately 0.99 acres will be created along both banks upstream of the dams, and along the west bank immediately downstream of the dams, and approximately 0.29 acres of forested wetlands will be created in two locations upstream of the dams, along the east bank and on the island. Additional restoration measures will include: removing debris on 0.09 acres between the dams, installing a sediment trap to reduce sediment loads reaching the river, and improving public access. Alternative A provides the greatest ecological uplift of the three (3) alternatives.

9.2.2 Alternative B

The restoration measures included in Alternative A also are included in Alternative B, with the exception of the forested wetland creation. Alternative B will remove approximately 0.56 acres of invasive

vegetation from the areas targeted for forested wetland creation in Alternative A, and will plant them with native vegetation. In Alternative B the extent of emergent wetland creation along the east bank of the river is also reduced. Alternative B provides ecological uplift intermediate between the ones provided by Alternatives A and C.

9.2.3 Alternative C

Relative to Alternative B, Alternative C further reduces the extent of emergent wetland creation, eliminating a creation area along the west bank of the river. Channel modification by excavating the river bottom and replacing the bed material is eliminated. Similarly, the softening of a section of the west bank is deleted. Alternative C provides the least ecological uplift of the three (3) alternatives.

9.3 Site 863. Stone Mill Dam

Stone Mill Dam is small site with limited ecological restoration opportunities. The site is situated within the New York Botanical Garden (NYBG) in a steep valley, having wooded side slopes, with grades over 40 percent and numerous, large rock outcrops. Most of the river shoreline and banks consist of bedrock and boulders. Wetlands at the site are practically non-existent and consist only of a few, very small (less than 5 square feet), discontinuous pockets of emergent vegetation adjacent to the shoreline.

Stone Mill Dam divides the site into two (2) hydrologic regimes. Above the dam, the river is slow and ponded, forming a large pool that is over four (4) feet deep, with a thick sediment deposit. Below the dam, swifter flows occur and the river bottom consists of cobbles and boulders, with pools in excess of four (4) feet deep. NYBG staff noted that samples from the river often contained high levels of coliform bacteria, and poor water quality due to illegal CSOs. Because of the extreme channel habitats, including a sediment-laden pond and fast-moving rocky channel, and the dam that is an obstacle for fish movement, the site provides low to moderate fish and wildlife habitat. The terrestrial habitats on site are used by species adapted for an urban environment. The woodlands on the slopes appear to be stable and do not appear to contribute to the sediment load. Ecological restoration measures that provide ecological uplifts such as aquatic habitat improvement, natural stream geomorphology restoration and habitat connection were the main focus for the alternatives designed for Stone Mill Dam.

The environmental stressors are identified as:

- Dam lowers water quality and impedes fish movement.

Due to the steeply sided slopes, there are limited restoration opportunities along the banks. As such, improvements to water quality and aquatic fauna should receive strong consideration. Currently there is a strong movement to restore anadromous and diadromous fish passage to the entire Bronx River. The presence of the dam is an obstacle to this goal, thus, the implementation of a fish ladder, especially when combined with fish attractors, would contribute to the goal of improving connectivity along the full length of the river.

9.3.1 Alternative A

Alternative A entails installing a fish ladder to link the slow-flowing pool upstream of the dam and the faster-flowing channel downstream of the dam. The fish ladder will open up approximately 35,128 linear feet of Bronx River for anadromous and catadromous fish between Stone Mill Dam and Bronxville Lake site. Clay-pipe fish attractors will be placed at both the upstream and downstream ends of the fish ladder to function as refuge habitat for fish. Native vegetation will be planted along the east bank of the

river, abutting the fish ladder. Invasive vegetation will be removed from a small area along the west bank, immediately downstream of the dam, and the area will be planted with native vegetation. Alternative A provides the greatest ecological uplift of the three (3) alternatives.

9.3.2 Alternative B

The fish ladder and native vegetation plantings along the east bank included in Alternative A are also included in Alternative B. In Alternative B, the clay-pipe fish attractors and the invasive species removal followed by select native plantings along the west bank as described in Alternative A are omitted. Alternative B provides ecological uplift intermediate between the uplift provided by Alternatives A and C.

9.3.3 Alternative C

Alternative C omits all of the restoration measures included in Alternatives A and B, entailing instead the excavation of the river bed and bed material replacement in an area upstream of the dam. Alternative C provides the least ecological uplift of the three (3) alternatives.

9.4 Site 113. Shoelace Park

Shoelace Park is the largest of the ten sites with numerous opportunities for ecological restoration uplift. Shoelace Park is surrounded by dense, urban development. The west side of the site largely consists of the Bronx River Parkway’s roadway embankment. The eastern side of the site is parkland, predominantly consisting of maintained lawns that rise on a slope of notable steepness, at approximately 25- to 30-percent grade, to roughly 60 feet in elevation above the river channel.

Much of the uplands within the site consist of lawns associated with the Park. In the extreme northern and southern portions of the site, deciduous woodlots occur. Along the banks of the river, dense pockets of Japanese knotweed are present. Erosion gullies were frequently observed on the upland slope.

The wetlands on site are limited to very narrow, lightly vegetated strips of emergent vegetation along the banks, with many areas of mudflat along the lower banks. The banks are nearly vertical in some locations and the faces of the banks are sparsely vegetated. The sandy-bottom channel of the river is generally one (1) to three (3) feet deep with limited riffles and pools. At several locations, rock vanes are constructed in the river, presumably in an attempt to modify the flow regime.

Due to the dense surrounding urban development, significant habitat fragmentation, sedimentation issues, and dense growth of invasive species, the site provides limited fish and wildlife habitat. Several locations of pedestrian access to the river appear to act as conduits for upland sediments and debris to enter into the river.

The three (3) alternatives focus on several key ecological restoration goals specific to Shoelace Park. Improving terrestrial habitat, wetland habitat and/or aquatic habitat was one of the main focuses for the site. Sediment load reduction and water quality were also significant ecological restoration goals that were incorporated into the alternatives for Shoelace Park.

Natural stream geomorphology restoration was difficult to incorporate into the alternatives without addressing the entire channel within Shoelace Park. For this reason only two (2) of the alternatives

focused on natural stream geomorphology restoration. The proposed alternatives for Shoelace Park are very different and provide different levels of ecological restoration uplift.

The environmental stressors are identified as:
- Vertical banks and over-widened channel;
- Invasive species;
- Limited wetlands; and
- Erosion and sedimentation.

Improvements to the park would complement existing recreational uses and substantially reduce erosion, sedimentation, and reduce environmental stressors for up to 1.3 miles of shoreline along the Bronx River.

9.4.1 Alternative A

Alternative A entails planting almost the entire length of the Bronx River Parkway roadway embankment along the west side of the Shoelace Park site, and the steep slope along the east bank of the river with native, upland trees and shrubs. Over 1.1 miles of banks will be upgraded and 1.3 miles of river bed will be upgraded. Over 2.95 acres of forested and scrub/shrub wetlands will be created along two (2) segments of the river on both banks. Along these segments, the river banks will be stabilized by constructing a wetland planting bench, and the river channel will be realigned using instream cross vanes and J-hooks. Between the two (2) forested wetland creation areas and near the southern end of the site, the banks will be stabilized using stacked rock walls with brush layers or crib walls, and the river bottom will be excavated, the bed material will be replaced, and cross vanes will be constructed. Additional restoration measures will comprise installing vegetated swales, bioretention basins, and raingardens at several locations adjacent to the east bank, in order to reduce sediment loads reaching the river; shoreline softening along the west bank at the southern end of the site, using a stacked rock wall with brush layers; and improving public access to the river. Alternative A provides the greatest ecological uplift of the three (3) alternatives.

9.4.2 Alternative B

The restoration measures included in Alternative A are also included in Alternative B, with the exception of the forested and scrub/shrub wetland creation. Throughout most of the length of the river within the site, inclusive of those segments where forested and scrub/shrub wetland creation is proposed in Alternative A, Alternative B will stabilize the banks for over 1 mile on each shoreline using stacked rock walls with brush layers. The river bottom will be excavated, the bed material will be replaced on approximately 1.2 miles, and cross vanes and J-hooks will be constructed. Alternative B provides an intermediate ecological uplift, in comparison with Alternatives A and C.

9.4.3 Alternative C

Relative to Alternative B, Alternative C eliminates bank stabilization using stacked rock walls with brush layers along both banks of the river for approximately one (1) mile. Alternative C provides the least ecological uplift of the three (3) alternatives.

9.5 Site 862. Muskrat Cove

The Muskrat Cove site is located just north of the Shoelace Park Site, flowing through a small, narrow valley located between a Metro North commuter rail line and the Bronx River Parkway. The majority of

the terrestrial area of the site consists of wooded slopes, dominated by deciduous species and fragmented by paved walkways, retaining walls, and other infrastructure. The uplands consist of maintained lawns associated with the park and the parkway right-of-way. Portions of the upland slopes are occupied by dense stands of Japanese knotweed.

The wetlands on site are limited to very small, isolated, sparsely vegetated pockets, dominated by jewelweed and purple loosestrife. The river is shallow, alternating between limited pools and occasional riffles. The river bottom is sandy with large boulders. Banks are armored throughout much of the site and, in some areas, vegetation has grown up through cracks in the armor. Where the banks are not armored, the banks are generally steep and some are undercut. Due to the past and ongoing disturbances at the site, small fragmented habitats, presence of invasive species, and armored banks, there exists limited fish and wildlife habitat value.

The Muskrat Cove three (3) alternatives are a variation of the same alternative. The measures that are proposed in alternative A and Alternative B are the same however the techniques that are proposed within the measures differ and provide different ecological uplift. For Muskrat Cove, natural stream geomorphology restoration was a main focus when designing the alternatives. Improvements to terrestrial habitat, wetland habitat, and aquatic habitat were also ecological restoration goals for the site.

The environmental stressors are identified as:

- Invasive species;
- Limited wetlands;
- Engineered banks;
- Poor aquatic habitat; and
- Bank erosion and compromised banks.

The river and aquatic environment in the project area was highly engineered with the goal of conveying water past large arterials (e.g., rail lines, roads, etc.) with little thought to potential impacts on the local ecology. The restoration measures consider these needs and were designed to keep the current alignment while utilizing environmental engineering techniques that result in an immediate ecological uplift and increase fish habitat.

9.5.1 Alternative A

Alternative A entails removing 0.49 acres of invasive vegetation from locations on the upland slopes and along both banks throughout the length of the Muskrat Cove site, and planting these locations with native, upland or wetland shrubs and herbaceous vegetation. Between Nereid Avenue and the rail line bridge over the river, sections of the river banks (approximately 1,350 linear feet) will be stabilized by constructing vegetated cribwalls and other sections will be softened using drilling with native plant materials. Within this portion of the site, debris will also be removed from the river. Two segments of the channel will be modified by excavating and replacing the bed material on approximately 1.24 acres and constructing instream cross vanes and J-hooks. Additional restoration measures will comprise installing a sediment basin at an existing outfall to reduce sediment loads reaching the river and removing a log jam and branch pile in the waterway at the rail line bridge.

9.5.2 Alternative B

The restoration measures proposed in Alternative A are also included in Alternative B. However, within the more upstream of the two (2) river segments where Alternative A will modify the channel with instream structures, Alternative B will instead restore the river bed (0.26 acres). In this segment, a riffle-pool complex will be created by excavating and replacing 0.10 acres of bed material, and placing cut and round boulders.

9.5.3 Alternative C

Relative to Alternative B, Alternative C proposes some of the restoration measures included in Alternative A. Alternative C entails removing invasive vegetation from locations on the upland slopes and along both banks throughout the length of the Muskrat Cove site, and planting these locations with native, upland or wetland shrubs and herbaceous vegetation. Alternative C proposes bank stabilization between Nerid Avenue and the rail line bridge as well as debris removal in the river and the construction of a sediment basin at an existing outfall to reduce sediment loads reaching the river.

9.6 Site 851. Bronxville Lake

At the Bronxville Lake site, the river flows through a broad valley, approximately 400 feet wide. A weir across the river at the southern end of the site creates a lake with two (2) broad and shallow lobes. A park, part of the Bronx River Parkway Reservation, surrounds the lake. The majority of the uplands at this site are maintained lawns with isolated trees located within the park and in the parkway right-of-way. Several small woodland areas, dominated by deciduous species, occur within the site. These areas are fragmented and provide limited habitat value. During the site visit, Canada geese (*Branta canadensis*) and their fecal matter were encountered throughout the site uplands.

Interspersed in the upland lawns, there are several small pockets of mowed wetlands in shallow depressions. Around the edge of the lake are discontinuous narrow strips of wetlands, typically two (2) to five (5) feet wide and sparsely vegetated with emergent vegetation. The vegetation, where present, is dominated by loosestrife and jewelweed. Within the lake, several sediment bars have formed with limited amounts of emergent vegetation.

The broad, shallow lake is subject to nutrient-enriched runoff from the park, and several drainage pipes empty into the lake from the parkway and other upland areas. The river shoreline in the northern portion of the site, and in the southern portion, adjacent to and downstream of the weir, are armored with large boulders. Around the lake, the short banks are generally vertical, with the upper bank predominantly lined with a single row of trees that are impacted with heavy vine growth. To the north, the river channel is narrower with steeper and higher banks.

The site is a suburban park and would only support species common to a suburban environment. The lack of shaded cover, shallowness of the lake, and lack of submerged aquatic vegetation or instream cover limit the habitat value of the lake for aquatic species. The adjacent uplands and pocket wetlands appear to be regularly mowed, resulting in little ecological value.

Bronxville Lake has several opportunities for ecological restoration measures. The three (3) proposed alternatives offer a range of ecosystem benefits for the site. The alternatives incorporate terrestrial habitat, wetland habitat and/or aquatic habitat improvement providing ecosystem benefits and ecological uplift. The alternatives also offer restoration measures to improve the stagnation and constricted flow within Bronxville Lake.

The environmental stressors are identified as:

- Subject to nutrient –laden runoff;
- Poor aquatic habitat: broad, shallow, slow moving aquatic environment;
- Limited wetlands; and
- Low ecological value uplands.

Although the lake provides aesthetic benefits in a park setting, the mowed lawns and substantial Canada goose population, sedimentation, and presence of a weir, promote environmental stressors, which contribute to poor aquatic habitat and lower water quality. Restoration would provide immediate ecological benefits and uplift. Removal of the stressors would substantially increase the ecological value of this 0.5- mile portion of the Bronx River and contribute to better water quality and benefits to the entire Bronx River, especially if conducted in concert with fish passage improvements upstream and downstream along the river.

9.6.1 Alternative A

Alternative A entails planting an area in the northwest portion of the site along the Bronx River Parkway, and a small area along the southeast portion of the lake with native upland trees and shrubs. A rip rap forebay (approximately 0.43 acres) will be constructed in the river channel, upstream of the lake, to cause sediment to settle out of the flow. Within the lake, the river channel will be realigned on approximately 1.28 acres by replacing the bed material and constructing instream cross vanes. Approximately 3.67 acres of emergent wetlands will be created between the channel and the lake banks and approximately 1.02 acres of forested and scrub/shrub wetlands will be created in three (3) locations around the lake perimeter. The existing rock weir at the southern end of the lake will be modified to facilitate fish passage. The fish passage will open 5,457 linear feet of new habitat in the Bronx River for anadromous and catadromous fish between the Bronxville Lake and Crestwood Lake. An adjacent, small patch of invasive vegetation (approximately 0.03 acres) will be removed and the location will be planted with approximately 1.40 acres of native vegetation. Additional restoration measures will comprise installing vegetated swales, bioretention basins, and raingardens at three (3) locations (approximately 0.24 acres) to reduce sediment loads reaching the river, as well as improving public access to the river. Alternative A provides the greatest ecological benefits and uplift of the three (3) alternatives.

9.6.2 Alternative B

The restoration measures included in Alternative A also are included in Alternative B, with exception of the channel realignment with instream structures within the lake, Alternative B will restore the bed on approximately 1.28 acres of the channel by excavating the bottom and installing bedding stone. The sediment within two (2) small sections of the channel and the adjacent lake bottom will be dredged. Although narrow strips of emergent vegetation will be created along the banks of the lake, emergent wetland will not be created between the channel and the banks. Rather, sections of the lake bottom will be filled and forested and scrub/shrub wetlands will be created in these areas, and the remainder of the lake bottom will be retained in open water habitat. Alternative B provides ecological uplift intermediate between the ones provided by Alternatives A and C.






9.6.3 Alternative C

Relative to Alternative B, Alternative C restricts forested and scrub/shrub wetland creation to a single area along the east bank of the river, upstream of the lake, and reduces the extent of emergent wetland creation to smaller and narrower strips along the lake shore. Alternative C will dredge the sediments in both broad, shallow lobes of the lake and will restore the bed along the intervening river channel. The existing rock weir at the southern end of the lake will not be modified; rather, a fish passage will be installed to link the lake and the river downstream of the weir. Alternative C provides the least ecological benefits and uplift of the three alternatives.

9.7 Site 852. Crestwood Lake

The Bronx River at the Crestwood Lake site flows through a broad valley (approximately 400 to 600 feet wide), the sides of which are approximately 20 feet high. The river enters the northern end of the site along a small segment of shady river channel, with a rock and sand bottom. At the southern end of the site, the river is dammed, forming a broad, shallow lake, approximately three (3) times wider than the width of the river immediately upstream. On the west side of the lake, Troublesome Creek, a small tributary of moderate flow, enters the lake. The lake is subject to nutrient enriched runoff from surrounding lawns and potentially from upstream sources.

Maintained lawns and lawns with single trees, woodlands dominated by deciduous trees and shrubs, and walking trails border the lake. During the site visit, Canada geese (*Branta canadensis*) and their fecal matter were encountered throughout the terrestrial areas on the site. A narrow, typically two (2)- to 10-foot wide wetland strip encircles most of the lake, dominated by emergent vegetation (loosestrife, jewelweed, water purslane, etc.) along most of the shore, but dominated by scrub/shrub vegetation within a segment along the southwest corner of the lake and a small segment along the eastern shore. Three (3) dense patches of invasive Japanese knotweed also occupy the lake shore. Large, vegetated sediment bars, densely covered with loosestrife, jewelweed, cattails, mallow, willows, alders, and common reed, as well as smaller mudflats, occupy the middle of the lake. A vegetated sediment bar also is present at the Troublesome Creek tributary confluence.

The site has moderate wildlife habitat value. The lack of shaded cover and shallowness of the lake and the lack of submerged vegetation or instream cover currently limits the habitat value of the lake for aquatic species. The woodlands on site provide habitat or serve as the home ranges for small- to medium-sized mammals, (e.g., squirrels, raccoons, etc.), but their fragmentation and lack of interspersion with the wetlands limits their value.

The alternatives proposed for Crestwood Lake are similar to the ecosystem restoration measures that are proposed for Bronxville Lake. The restoration goals for the proposed measures for Crestwood Lake include sediment load reduction, habitat connection and improvements to terrestrial, wetland and aquatic habitats. Increasing channel flow and reducing stagnation within the channel was also a main focus for the proposed Alternatives.

The environmental stressors are identified as:

- Poor aquatic habitat (broad, shallow, with limited flow);
- Nutrient enrichment;
- Barrier to fish passage;
- Sedimentation and erosion; and
- Invasive species.

The aquatic habitat at Crestwood Lake is stressed. Nutrient-enriched runoff and the broad shallow slow-flowing waters results in poor water quality. The lake encompasses a 0.25-mile stretch of the river. All alternatives, consider the parklike aesthetic values of the lake, yet are targeted to increase the value of aquatic habitat and improve water quality.

9.7.1 Alternative A

Alternative A entails planting three (3) areas, approximately 0.14 acres, in the western portion of the site along the Bronx River Parkway with native, upland trees and shrubs, and removing invasive vegetation from three (3) locations along the lake shore and an additional two (2) locations near the weir. These locations would then beplanted with native, upland or wetland shrubs and herbaceous vegetation. Two (2) rip rap forebays will be constructed, one in the upstream end of the lake and a second at the Troublesome Creek tributary confluence, to cause sediment to settle out of the river and creek flows. Within the lake, approximately 1.24 acres of the river channel will be realigned by replacing the bed material and constructing instream cross vanes. Throughout the lake, emergent wetland will be created (approximately 4.79 acres) between the channel and the lake banks. The existing rock weir at the southern end of the lake will be modified to include slopes and pools to promote fish passage. The fish passage will open up 10,499 linear feet of new habitat in the Bronx River for anadromous and catadromous fish between Crestwood Lake and Harney Road site. Additional restoration measures will comprise improving public access to the river. Alternative A provides the greatest ecological benefits and uplift of the three (3) alternatives.

9.7.2 Alternative B

Alternative B will restore approximately 1.24 acres of the bed of the channel by excavating the bottom and installing bedding stone. The extent of emergent wetland created within the lake between the channel and the banks will be restricted to a single location (approximately 0.94 acres), immediately downstream of the forebay at the river inlet, along the west bank of the lake. Alternative B provides ecological benefits and uplift intermediate between the uplift provided by Alternatives A and C.

9.7.3 Alternative C

Relative to Alternative B, Alternative C further reduces the extent of emergent wetland creation to a smaller area of 0.32 acres, immediately downstream of the forebay at the river inlet. The river channel within Crestwood Lake will not be realigned; nor will the channel bed be restored. Rather, Alternative C will dredge the sediment within two (2) small sections of the channel and the adjacent lake bottom to create deeper pools. Also, under Alternative A, a fish passage will be installed to link the lake and the river downstream of the weir. Alternative C provides the least ecological benefits and uplift of the three (3) alternatives.

9.8 Site 853. Harney Road

From a four (4)-foot-high weir located immediately south of the Harney Road Bridge, the Harney Road site extends upstream to the Garth Woods site. The site is bounded to the west by woodlands that extend west of the southbound lanes of the Bronx River Parkway, and is bounded to the east by the northbound lanes. The Bronx River flows between the southbound lanes and the northbound lanes of the parkway. Within the site, the river is over-widened, with a width of approximately 60 feet, shallow, with depths often less than two (2) feet, and slow moving. A single deep pool is present at the northern end, just downstream of the Garth Woods site.

Narrow wetland strips, vegetated with jewelweed, purple loosestrife, sedges, and willow shrubs, occupy sections of both shores of the river, and an isolated stand of cattails occupies the eastern shore just upstream of Harney Road. Dense stands of invasive Japanese knotweed occur along two (2) sections of the west bank. Upstream of the road, the river banks are generally vertical and show signs of moderate erosion, and the banks south of Harney Road are armored.

On the west side of the river, a steep road embankment, a narrow strip of lawn, and some patches of trees and shrubs extend from the shore to the southbound lanes of the parkway. On the east side, a shallower slope of maintained lawns, a paved path, and a strip of woodland extends to the northbound lanes. Just north of Harney Road, a buried storm drain is causing sediment deposition and minor erosion. West of the southbound lanes of the parkway, there is a large mowed lawn area with scattered single trees and several mowed pockets of emergent wetlands.

The woodland area on the Harney Road site provides some value to small and mid-sized mammals adapted to suburban environments. No large rooted beds of aquatic vegetation were observed in the river and, due to the broad and shallow channel and narrow wetlands, it is likely that the river in this section currently provides limited habitat value for fish.

The alternatives created for Harney Road focus on improving and creating new habitats within the site. The Harney Road over-widened channel is a significant impairment that the proposed alternatives concentrate on restoring. Proposed measures also focused on sediment load reduction within the project boundary.

The environmental stressors are identified as:

- Poor aquatic habitat (broad shallow, slow moving);
- Limited wetlands;
- Sedimentation and erosion;
- Uplands of low-ecological value; and
- Barriers to fish movement.

The increase in the acreage of wetlands would result in an immediate improvement in water quality. The lawn west of the Bronx River Parkway is actively mowed, even though facultative vegetation is present. Allowing this area to return to an emergent wetland, coupled with targeted plantings and other wetland mitigation efforts, would further increase its ecological value and increase the water quality of the Bronx River through the sequestration of nutrients. The lake also has poor fish habitat and the weir presents a barrier to fish movements, therefore, the removal of these stressors would result in immediate improvements to habitat and water quality and would allow fish, especially anadromous and catadromous species, to access greater portions of the Bronx River.

9.8.1 Alternative A

Alternative A entails modifying the existing weir at the southern end of the site to promote fish passage, modifying approximately 0.85 acres of the river channel upstream of Harney Road and a short off-site section of river channel downstream of the weir by replacing the bed material and constructing instream cross vanes, and creating approximately 0.79 acres of emergent wetlands along both shores of the river. Modifying the fish passage impendent would result in providing catadromous and anadromous fish species with 40,448linear feet of new available habitat in the Bronx River between Harney Road site to the Kensico Dam. Native upland trees and shrubs will be planted between the created emergent

wetlands on the east shore and the paved path. Three (3) culverts will be constructed under the southbound lanes of the Bronx River Parkway to transfer river water to emergent wetlands created throughout most of the maintained lawn area on the west side. Within these wetlands, a wet meadow will surround a core dominated by cattails. Additional restoration measures will comprise removing approximately 0.03 acres of invasive Japanese knotweed from a location along the west bank of the river, just north of Harney Road, and planting this location with native, upland or wetland shrubs and herbaceous vegetation, installing a raingarden/bioretention area at the upstream end of the buried storm drain to control erosion at this location and reduce sediment loads reaching the river, and softening a segment (approximately 190 linear feet) of the west bank of the river, downstream of the weir, by constructing a stacked rock wall with brush layers. Alternative A provides the greatest ecological uplift of the three (3) alternatives.

9.8.2 Alternative B

The restoration measures included in Alternative A also are included in Alternative B, with the exception of channel modification with instream structures, upstream of Harney Road. Alternative B will restore the bed of the channel by excavating and replacing approximately 1.34 acres of bed material. Alternative B will not construct culverts under the southbound lanes of the parkway. The extent of emergent wetland creation within the maintained lawn to the west of the southbound lanes will be restricted to cattail-dominated core described in Alternative A, and native upland trees and shrubs will be planted within the Alternative A wet meadow. Weir modification will not incorporate slopes and pools to promote fish passage; the west bank of the river, downstream of the weir, will not be softened; and the off-site section of river channel downstream of the weir will not be modified. Alternative B provides ecological uplift intermediate between the ones provided by Alternatives A and C.

9.8.3 Alternative C

Relative to Alternative B, Alternative C will not restore the river bed; nor will the channel be modified. Forested and scrub/shrub wetland creation will replace emergent wetland creation within the maintained lawn to the west of the southbound lanes of the parkway. The existing weir at the southern end of the site will not be modified; rather, a fish passage will be installed to link the upstream and downstream segments of the river. Alternative C provides the least ecological uplift of the three (3) alternatives.

9.9 Site 853. Garth Woods

North of Harney Road, the river has changed its course and currently runs along a section of stone wall supporting the Bronx River Parkway. Armoring at the base of a large specimen tree resulted in the shifting of the entire Bronx River channel at the Garth Woods site. The new river course runs along a section of stone wall supporting the Bronx River Parkway. The Garth Wood site consists of a large forested area, bordered by the northbound lanes of the Bronx River Parkway and traversed by a paved path on the east, and bordered by the Bronx River and the parkway southbound lanes on the west. The northbound lanes of the parkway and a pedestrian bridge cross the river channel near the northern end of the site and the Harney Road site borders the Garth Woods site on the south.

Along this river segment, approximately three quarters (3/4) of the west bank of the Bronx River consist of the vertical walls of the Bronx River Parkway embankment, which is undercut. The remainder of the west bank and the entire east bank are abutted by contiguous floodplain forest. Most of the east bank is low, steep, and sparsely vegetated; boulders and tree roots provide moderate bank stability. The river

contains numerous riffles and pools throughout its course, with a benthic substrate of boulders and cobbles. Sediment deposits were observed in the northern portion of the channel during the site visit.

Wetlands on the Garth Woods site consist of narrow strips along the east shore of the river that are very sparsely vegetated with emergent vegetation, and forested, wet depressions within the adjacent forests, mostly within a remnant, abandoned river channel, east and north of the current channel. The forested wetlands are dominated by emergent vegetation, including skunk cabbage, jewelweed, and cinnamon fern. During the site visit, evidence of potential vernal pool habitat also was observed within the forested areas. There are no wetlands along the western shore of the river, along the parkway embankment.

Mostly, the uplands consist of deciduous, floodplain forest, with elms, sycamores, oaks, and maples. Within the upland areas, extensive, dense stands of Japanese knotweed are present, especially bordering the remnant river channel. Large sand deposits occupy portions of the remnant channel. The contiguous forested floodplain and the riffle pool complex of the river provides moderate habitat value for both terrestrial and aquatic species.

The Garth Woods site has an existing remnant channel that provides opportunity for various restoration measures. The alternative proposes to use the remnant channel for restoration purposes. Invasive species were observed on much of the Garth Woods site during site investigations.

The environmental stressors are identified as:

- Invasive species;
- Bronx River Parkway forms a portion of the bank;
- Unstable banks; and
- Sediment deposits.

Much of the restoration at this site, including realignment of the river away from the Bronx River Parkway, is being implemented by Westchester County, the local non-federal sponsor. Therefore, complementary restoration actions limited to removal of invasive species and native planting is being proposed. The proposed actions would remove invasive species from the northern portion of the site and increase the forest cover through plantings. This alternative has been combined with the Harney Road site for the recommendation of a single site, Garth Woods/Harney Road. The combined Garth Woods/Harney Road site, in conjunction with Westchester County’s restoration of Garth Woods, leverages resources and significant ecosystem benefits to address the environmental stressors in this area.

9.9.1 Alternative A

Alternative A-2 is the only restoration alternative proposed for the Garth Woods site. The Alternative A-2 restoration measures are restricted to the northernmost portion of the site, as restoration of the remainder of the site will be formulated and evaluated independent of this feasibility study by Westchester County. Alternative A-2 entails approximately 0.03 acres of forested and scrub/shrub wetland creation along the west bank of the river at the upstream end of the site approximately 0.14 acres of select native plantings in the adjacent lawn, on both sides of the paved path; and removing approximately 0.02 acres of invasive species such as Japanese knotweed from a location near the northern border of the site and planting this location with native, upland or wetland shrubs and herbaceous vegetation.

9.10 Site 854. Westchester County Center

The Westchester County Center site is bounded roughly by the southbound lanes of the Bronx River Parkway to the west, a gas line and the Metro North right-of-way to the east, and the Westchester County Center east parking lot to the south. Site topography is generally flat; the only notable change in elevation being along the eastern boundary of the site, where the rail line embankment rises roughly 20 to 30 feet in elevation. The Bronx River and the parkway northbound lanes traverse the site, flanked by large tracts of maintained lawn with trees, and with woodlands in the southeastern corner of the site. The confluences of two (2) tributaries, Manhattan Brook and the Fulton Brook, occur on the site.

Within the site, the river is generally shallow, with some deep pools. Mostly, the river bottom is sandy, with several mudflats and sparsely vegetated sediment deposits. A large deposit has formed an island just north of the Fulton Brook confluence and is collecting river-borne garbage and debris. The river has a moderate flow, although sediment staining on vegetation, wrack lines, and other hydrologic indicators suggests that this section of the river is subject to strong and high flows during storm events. The river’s vertical banks show sign of active erosion and are sparsely vegetated. The extreme southernmost section of the river on site and a section at the Fulton Brook confluence have armored banks.

Within the northern half of the site, wetlands along the river banks are present as narrow fringe wetlands, typically less than one (1) to two (2) feet wide and sparsely vegetated with emergent vegetation. Within the southern half of the site, wetlands along the banks are present as broader patches of emergent wetlands, situated on a topographic shelf that is of lower elevation than the surrounding uplands. These wetlands are dominated by jewelweed and purple loosestrife, but also have dense growth of Japanese hops and other vines. West of and adjacent to the gas line, a few patches of emergent wetlands are present, dominated by jewelweed, iris, purple loosestrife, path rush, and skunk cabbage, with pockets of common reed and some alder and elm. Within the woodlands in the southeastern corner of the site are pockets of wetlands and potential vernal pool habitat.

The majority of the uplands on site consist of flat, maintained park and right-of-way lawns with single or clustered trees. Adjacent to the river banks, thick stands of Japanese Knotweed and numerous vines dominate. Along the easternmost portion of the site, a narrow strip of woodlands occurs, comprising maples, oaks, elms, and other common deciduous woodland species.

The Westchester County Center site currently provides low to moderate fish and wildlife habitat value, primarily to species adapted for a suburban environment. The woodlands in the eastern portion of the site provide greater ecological value as they contain potential vernal pool habitat and buffer wetland habitats. Sediment deposition and non-point source pollution from the two (2) tributaries appear to be negatively impacting the site’s aquatic habitats.

The Westchester County Center site is a large site with numerous opportunities for different ecological restoration measures. The restoration measures proposed in the three (3) alternatives provide the site with varying levels of ecological restoration benefits and uplift in order to address the environmental stressors. For the Westchester County Center site, sediment load reduction and wetland habitat improvements proposes significant ecological benefits at the site. Each proposed alternative provides significant ecological benefits and uplift for the Westchester County Center site.

The environmental stressors are identified as:

- Garbage and debris;
- Invasive species;

- Bank erosion and sedimentation; and
- Limited wetlands.

The project area represents an approximate 0.5-mile long portion of the Bronx River, including the confluence of two (2) tributaries. Located between the north and southbound lanes of the Bronx River Parkway, the site is not likely to be developed. Also, the roadways isolate portions of the site that wildlife would find attractive if appropriate habitats and vegetation were present. There is significant erosion and sedimentation within this stretch of the river. Implementing the restoration alternatives would have positive effects to both wildlife and water quality; moreover, the placement of wetlands would contribute to lessening flooding in the project area.

9.10.1 Alternative A

Alternative A entails realigning approximately 1.99 acres of the river channel and the on-site section of Manhattan Brook, by excavating and replacing the bed material and constructing instream cross vanes; and creating emergent wetlands along both shores of the river and along both shores of Manhattan Brook. Instream sediment basins will be constructed in a short segment of Manhattan Brook and in Fulton Brook at its confluence with the river. To restrict river flows to the channel on the west side of the island just north of the Fulton Brook confluence, channel plugs will be constructed at the upstream and downstream ends of the channel on the east side of the island, and the plugs will be planted to upland vegetation. Native, upland trees and shrubs will be planted along the west side of the parkway northbound lanes. Additional restoration measures will comprise removing approximately 0.26 acres of invasive vegetation from two (2) locations along the eastern boundary of the site, and planting these locations with select native vegetation, and constructing a 500-foot-long paved path to divert pedestrian traffic away from an emergent wetland creation area. Approximately 4.79 acres of emergent wetland creation is proposed along the east and west banks of the channel. Alternative A provides the greatest ecological benefits of the three (3) alternatives.

9.10.2 Alternative B

The restoration measures included in Alternative A also are included in Alternative B, except the river channel and the on-site section of Manhattan Brook will not be realigned with instream structures. Rather, Alternative B will modify segments of approximately 0.83 acres of the river channel by excavating and replacing the bed material, and installing instream cross vanes and J-hooks. Channel modification of a river segment along the downstream side of the island, and constructing channel plugs at the upstream and downstream ends of the channel on the west side of the island, will shift the Fulton Brook confluence with the river to the east. Alternative B will stabilize approximately 285 linear feet of the west bank of the river with a tiered rock slope and will stabilize a segment of the east bank with a stacked rock wall. Relative to Alternative A, the extent of emergent wetland creation will be reduced to approximately 2.64 acres. Generally, the extent of select native plantings will be increased to 0.28 acres; however, Alternative B will not replant an area along the northern boundary of the site that Alternative A designates for select native plantings. Additional restoration measures in Alternative A will comprise removing invasive vegetation from two (2) locations along the western boundary of the site along Manhattan Brook and planting these locations with select native vegetation. Alternative B provides ecological benefits and uplift intermediate between the uplift provided by Alternatives A and C.

9.10.3 Alternative C

Alternative C proposes emergent wetland creation along both shores of the river and along both shores of Manhattan Brook. Instream sediment basins will be constructed in a short segment of Manhattan

Brook and in Fulton Brook at its confluence with the river. Alternative C entails native, upland trees and shrubs will be planted along the west side of the parkway northbound lanes and d ebris remove debris from the upstream portion of the island. Alternative C provides the least ecological benefits and uplift of the three (3) alternatives.

Chapter 10: Uplands

Uplands were assessed using a modified method of EPW (see Chapter 6). In reviewing the data collected on Uplands, the Alternative designs were targeted to remove upland stressors to the greatest extent possible. Table 10-1 below identifies the sites and upland enhancements that were considered.

In many instances, large open lawns that are of low ecological value would be planted with select native plantings in order to increase woodlands and improve the riparian buffer zone, protect adjacent wetlands, stabilize shorelines and provide secondary benefits of improved water quality and flood risk management within the Bronx river Basin.

Table 10-1: Corrective Actions for Each Alternative (Uplands)

Site	Major Upland Environmental Stressors	Alt A	Alt B	Alt C
River Park/West Farm Rapids Park	Erosion, very limited and disturbed wildlife habitat, invasive species	• Select native plantings to increase woodlands. • Invasive species removal with select native plantings. • Stabilization of shorelines.	• Select native plantings to increase woodlands. • Invasive species removal with select native plantings. • Stabilization of shorelines.	• Select native plantings to increase woodlands. • Invasive species removal with select native plantings. • Stabilization of shorelines.
Bronx Zoo and Dam	Marginal erosion / sedimentation and wildlife habitat	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction.
Stone Mill Dam	Invasive species	• Invasive species removal with select native plantings. • Select native plantings in woodlands.	• Select native plantings in woodlands.	
Shoelace Park	Erosion, very limited and disturbed wildlife habitat, invasive species	• Invasive species removal with select native plantings (substantial activities – in coordination with NYC Parks). • Select native plantings to increase woodlands. • Sediment load reduction (substantial activities in coordination with NYCDEP).	• Invasive species removal with select native plantings (substantial activities – in coordination with NYC Parks). • Select native plantings to increase woodlands. • Sediment load reduction (substantial activities in coordination with NYCDEP).	• Invasive species removal with select native plantings (substantial activities – in coordination with NYC Parks). • Sediment load reduction (substantial activities in coordination with NYCDEP).

Site	Major Upland Environmental Stressors	Alt A	Alt B	Alt C
Muskrat Cove	very limited and disturbed wildlife habitat, invasive species	• Invasive species removal with select native plantings.	• Invasive species removal with select native plantings.	• Invasive species removal with select native plantings.
Bronxville Lake	Invasive species Limited wildlife habitat – large open lawns.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction.
Crestwood Lake	Invasive species Limited wildlife habitat – large open lawns.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands.
Harney Road/ Garth Woods	Invasive species Limited wildlife habitat – large open lawns.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction. • Westchester County to perform considerable restoration actions in Garth Woods.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction. • Westchester County to perform considerable restoration actions in Garth Woods.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands. • Sediment load reduction. • Westchester County to perform considerable restoration actions in Garth Woods.
Westchester County Center	Limited wildlife habitat – large open lawns.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands.	• Invasive species removal with select native plantings. • Select native plantings to increase woodlands.

Chapter 11: SVAP

A Stream Visual Assessment Protocol (SVAP) was performed for each of the Bronx River sites. For both 1 year after construction and 20 years after construction. See Attachment C for SVAP sheets and results.

11.1 SVAP Results - One Year After Construction

The existing conditions scores are provided in addition to SVAP scores calculated for the project area for Alternatives A, B, and C for one (1) year after construction and 20 years after construction, provided in Attachment C. Per SVAP guidelines, streams are ranked from poor to excellent based on the following scoring: Poor <6; Fair 6.1-7.4; Good 7.5 – 8.9; and Excellent >9.0.

11.1.1 River Park/West Farm Rapids Park

This portion of the Bronx River is rated 4.3 or poor. The ratings for Alternatives A, B, and C are 6.2, 5.8, and 5.6, respectively. Alternative A would increase the score of this stretch of the river to fair. Alternatives B and C would be 0.8 and 1 below the fair rating. Regardless, the construction of the fish ladder and proposed restoration improvements considerably raises the SVAP scores.

11.1.2 Bronx Zoo and Dam

This portion of the Bronx River is rated 3.9 or poor. The ratings for Alternatives A, B, and C are 5.8, 5.8 and 5.4, respectively. Although all alternatives improve water quality compared to baseline, the rating for this reach of the Bronx River at the Bronx Zoo and Dam site would remain poor.

11.1.3 Stone Mill Dam

This portion of the Bronx River is rated 6.2 or fair. The ratings for Alternatives A, B and C are 7.0, 7.0, and 6.4, respectively. All alternatives improve water quality. However, despite the restoration methods that would be implemented, under each of the alternatives the rating for the reach of the Bronx River in the Stone Mill Dam site remains fair. The implementation of fish ladder under Alternatives A and B, would raise the scores considerably more than Alternative C.

11.1.4 Shoelace Park

This portion of the Bronx River is rated 4.8 or poor. All alternatives would raise this score. With both Alternatives A (6.8) and B (6.1), the rating for this reach of the Bronx River in the Shoelace Park site would be raised to fair; however, despite the restoration methods that would be implemented under Alternative C (5.4), the rating would remain poor.

11.1.5 Muskrat Cove

This portion of the Bronx River is rated 5.9 or poor. All alternatives raise this score. Under Alternatives A (7.1), B (7.3), and C (6.9), the ratings for the reach of the Bronx River in the Muskrat Cove site would be raised to fair.

11.1.6 Bronxville Lake

This portion of the Bronx River is rated 2.9 or poor. The ratings for Alternatives A, B, and C are 5.3, 5.2 and 4.6, respectively. All alternatives raise this score noticeably, as they either convert the lake back to a proper stream habitat or dredging is performed to deepen the lake. Although, under each of the alternatives the rating for the reach of the Bronx River in the Bronxville Lake site remains poor.

11.1.7 Crestwood Lake

This portion of the Bronx River is rated 3.8 or poor. The ratings for Alternatives A, B, and C are 4.4, 4.1 and 4.0, respectively. All alternatives raise this score. However, despite the restoration methods that would be implemented, under each of the alternatives the rating for the reach of the Bronx River in in the Crestwood Lake site remains poor. Alternative A which returns the lake to a natural stream setting results in a score of 5.4, which is 1.0 below the “fair rating”.

11.1.8 Harney Road

This portion of the Bronx River is rated 4.0 or poor. The ratings for Alternatives A, B, and C are 5.7, 5.0 and 4.5, respectively. All alternatives raise this score. However, despite the restoration methods that would be implemented, under each of the alternatives the rating for the reach of the Bronx River in in the Harney Road site would remain poor, with scores ranging between 4.5 and 5.7. These lower scores are a result of several stressors that would continue under the alternatives (e.g., presence of where restricting some movement, broad shallow waterbody with limited vegetative cover, etc.).

11.1.9 Garth Woods

Currently, this portion of the Bronx River is rated 6.5 or fair. Alternative A raises this score by 0.1. However despite the restoration methods that would be implemented, the rating for the reach of the Bronx River in the Garth Woods site remains fair. The score for Alternative A only considers invasive removal and native planting and does not account for the additional improvements resulting from the restoration actions that will be conducted by Westchester County.

11.1.10 Westchester County Center

This portion of the Bronx River is rated 5.9 or poor. The ratings for Alternatives A, B, and C are 7.7, 7.2 and 6.4, respectively. All alternatives raise this score. Under Alternatives A, this portion of the Bronx River would be rated as good. Under alternatives B and C, the stretch of the river would be rated as fair; although Alternative B’s score is 0.8 higher than Alternative C.

Table 11-1: SVAP Scores - One Year After Construction

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 1	B Yr 1	C Yr 1
River Park/West Farm Rapids Park	Channel Condition	3	7	7	6
	Hydrologic Alteration	1	1	1	1
	Riparian Zone	1	8	8	8
	Bank Stability	10	10	10	10
	Water Appearance	7	8	8	8
	Nutrient Enrichment	5	6	6	6
	Barriers to Fish Movement	1	7	7	7
	Instream Fish Cover	3	4	3	3
	Pools	7	8	8	8
	Invertebrate Habitat	3	3	3	3
	Canopy Cover	5	5	5	5
	Riffle Embeddedness	5	6.5	6	6
	Final Score	**4.3**	**6.1**	**6**	**5.9**
Bronx Zoo and Dam	Channel Condition	7	7	7	7
	Hydrologic Alteration	1	2	1	1
	Riparian Zone	5	6	6	6
	Bank Stability	7	8	8	7
	Water Appearance	7	8	8	8
	Nutrient Enrichment	7	8	8	8
	Barriers to Fish Movement	1	7	7	7
	Instream Fish Cover	3	5	5	4
	Pools	3	4	4	3
	Invertebrate Habitat	3	5	5	4
	Canopy Cover	1	2	2	2
	Manure Presence	1	1	2	2
	Riffle Embeddedness	5	6	6	5
	Final Score	**3.9**	**5.3**	**5.3**	**4.9**
Stone Mill Dam	Channel Condition	8	8	8	8
	Hydrologic Alteration	1	1	1	1
	Riparian Zone	8	8.5	8.5	8
	Bank Stability	7	7	7	7
	Water Appearance	8	8	8	8
	Nutrient Enrichment	8	8	8	8.5
	Barriers to Fish Movement	1	9	9	1
	Instream Fish Cover	5	6.5	5	5

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 1	B Yr 1	C Yr 1
	Pools	7	7	7	8
	Canopy Cover	10	10	10	10
	Riffle Embeddedness	5	5	5	6
	Final Score	**6.2**	**7.1**	**7**	**6.4**
Shoelace Park	Channel Condition	3	7	6	5.5
	Hydrologic Alteration	3	4	4	4
	Riparian Zone	5	7	5.5	5
	Bank Stability	3	8	7	6
	Water Appearance	7	7	7	7
	Nutrient Enrichment	8	8	8	8
	Barriers to Fish Movement	8	8	8	8
	Instream Fish Cover	5	7	5.5	5
	Pools	3	8	7	3
	Invertebrate Habitat	5	6	5.5	5
	Canopy Cover	5	6	5	5
	Riffle Embeddedness	3	6	5	3
	Final Score	**4.8**	**6.8**	**6.1**	**5.4**
Muskrat Cove	Channel Condition	1	4	4	3
	Hydrologic Alteration	4	4.5	4.5	4.5
	Riparian Zone	8	8	8	8
	Bank Stability	1	6	6	5
	Water Appearance	9	9	9	9
	Nutrient Enrichment	9	9	9	9
	Barriers to Fish Movement	10	10	10	10
	Instream Fish Cover	5	5.5	5	5
	Pools	4	7	7	5
	Invertebrate Habitat	6	6	6.5	6
	Canopy Cover	7	7	7	7
	Riffle Embeddedness	7	7	7.5	7
	Final Score	**5.9**	**6.9**	**7**	**6.5**
Bronxville Lake	Channel Condition	1	7	6	6
	Hydrologic Alteration	3	5	4	3
	Riparian Zone	1	8	4	2
	Bank Stability	5	7	5	5
	Water Appearance	7	7	7	7
	Nutrient Enrichment	5	6.5	5.5	5

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 1	B Yr 1	C Yr 1
	Barriers to Fish Movement	5	8	8	9
	Instream Fish Cover	1	5	3	3
	Pools	2	3	6	8
	Invertebrate Habitat	3	5	5	4
	Canopy Cover	1	3	2	1
	Manure Presence	1	5	3	2
	Final Score	**2.9**	**5.8**	**4.9**	**4.6**
Crestwood Lake	Channel Condition	7	9	7	7
	Hydrologic Alteration	3	7	7	7
	Riparian Zone	5	8	6	5.5
	Bank Stability	5	7	5	6
	Water Appearance	7	7	7	7
	Nutrient Enrichment	7	7	7	7
	Barriers to Fish Movement	1	5	5	7
	Instream Fish Cover	3	4	4	5
	Pools	2	5	4	7
	Invertebrate Habitat	3	4	4	4
	Canopy Cover	1	3	1	1
	Manure Presence	1	5	1	1
	Final Score	**3.8**	**5.9**	**4.8**	**5.4**
Harney Road	Channel Condition	3	7	7	4
	Hydrologic Alteration	1	4	2	1
	Riparian Zone	7	8.5	7.5	7.5
	Bank Stability	7	8.5	7.5	7.5
	Water Appearance	7	7	7	7
	Nutrient Enrichment	8	8	8	8
	Barriers to Fish Movement	1	3	3	6
	Instream Fish Cover	3	5	3	3
	Pools	3	7	6	4
	Invertebrate Habitat	3	3	3	3
	Canopy Cover	1	1	1	1
	Final Score	**4**	**5.6**	**5**	**4.7**
Garth Woods	Channel Condition	5	5	N/A	N/A
	Hydrologic Alteration	3	3	N/A	N/A
	Riparian Zone	5	6	N/A	N/A
	Bank Stability	7	7	N/A	N/A

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 1	B Yr 1	C Yr 1
	Water Appearance	8	8	N/A	N/A
	Nutrient Enrichment	10	10	N/A	N/A
	Barriers to Fish Movement	3	3	N/A	N/A
	Instream Fish Cover	5	5	N/A	N/A
	Pools	7	7	N/A	N/A
	Invertebrate Habitat	7	7	N/A	N/A
	Canopy Cover	10	10	N/A	N/A
	Riffle Embeddedness	8	8	N/A	N/A
	Final Score	**6.5**	**6.6**	**N/A**	**N/A**
Westchester County Center	Channel Condition	5	7	7	7
	Hydrologic Alteration	5	7	7	7
	Riparian Zone	8	10	10	9
	Bank Stability	5	8	7	6
	Water Appearance	7	7	7	7
	Nutrient Enrichment	7	7	7	7
	Barriers to Fish Movement	10	10	10	10
	Instream Fish Cover	5	8	6	5
	Pools	3	7	7	3
	Invertebrate Habitat	3	5	3	3
	Canopy Cover	10	10	10	10
	Riffle Embeddedness	3	6	5	3
	Final Score	**5.9**	**7.7**	**7.2**	**6.4**

11.2 SVAP Results – 20 Years After Construction

The SVAP scores provided in Table 11-2 represent conditions 20 years after construction. It was assumed that the life span for sturdy structures such as crib walls and stacked rock augmented by cross veins and J-hooks that are proposed in design alternatives to accommodate alluvial stresses placed on the river banks and adjacent riparian areas would exceed 20 years. Thus, for most, if not all the sites, any natural changes to the shorelines were given limited consideration as there would be little change due to erosion and/or deposition. Moreover, although the addition of these features and river bed replacement would increase the benthic habitat, the extreme hydrology will continue to be encountered and would limit long-term benthic development; thus, similar scoring occurs for 1 year after construction and 20 years after construction. Per SVAP guidelines, streams are ranked from poor to excellent based on the following scoring: Poor <6; Fair 6.1-7.4; Good 7.5 – 8.9; and Excellent >9.0.

Table 11-2: SVAP Scores - 20 Years After Construction

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 20	B Yr 20	C Yr 20
River Park/West Farm Rapids Park	Channel Condition	3	7	7	6
	Hydrologic Alteration	1	1	1	1
	Riparian Zone	1	8	8	8
	Bank Stability	10	10	10	10
	Water Appearance	7	8	8	8
	Nutrient Enrichment	5	6	6	6
	Barriers to Fish Movement	1	7	7	7
	Instream Fish Cover	3	4	3	3
	Pools	7	8	8	8
	Invertebrate Habitat	3	3	3	3
	Canopy Cover	5	5	5	5
	Riffle Embeddedness	5	6.5	6	6
	Final Score	**4.3**	**6.1**	**6**	**5.9**
Bronx Zoo and Dam	Channel Condition	7	7	7	7
	Hydrologic Alteration	1	2	1	1
	Riparian Zone	5	6	6	6
	Bank Stability	7	8	8	7
	Water Appearance	7	8	8	8
	Nutrient Enrichment	7	8	8	8
	Barriers to Fish Movement	1	7	7	7
	Instream Fish Cover	3	5	5	4
	Pools	3	4	4	3
	Invertebrate Habitat	3	5	5	4
	Canopy Cover	1	2	2	2
	Manure Presence	1	1	2	2
	Riffle Embeddedness	5	6	6	5
	Final Score	**3.9**	**5.3**	**5.3**	**4.9**
Stone Mill Dam	Channel Condition	8	8	8	8
	Hydrologic Alteration	1	1	1	1
	Riparian Zone	8	8.5	8.5	8
	Bank Stability	7	7	7	7
	Water Appearance	8	8	8	8
	Nutrient Enrichment	8	8	8	8.5
	Barriers to Fish Movement	1	9	9	1
	Instream Fish Cover	5	6.5	5	5

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 20	B Yr 20	C Yr 20
	Pools	7	7	7	8
	Canopy Cover	10	10	10	10
	Riffle Embeddedness	5	5	5	5
	Final Score	**6.2**	**7.1**	**7**	**6.3**
Shoelace Park	Channel Condition	3	7.5	6	5
	Hydrologic Alteration	3	4	4	4
	Riparian Zone	5	7	5.5	5
	Bank Stability	3	8.5	7.5	6.5
	Water Appearance	7	7	7	7
	Nutrient Enrichment	8	8	8	8
	Barriers to Fish Movement	8	9	9	9
	Instream Fish Cover	5	7	5.5	5
	Pools	3	8	7	3
	Invertebrate Habitat	5	6	5.5	5
	Canopy Cover	5	7.5	5	5
	Riffle Embeddedness	3	6	5	3
	Final Score	**4.8**	**7.1**	**6.3**	**5.5**
Muskrat Cove	Channel Condition	1	4	4	3
	Hydrologic Alteration	4	4.5	4.5	4.5
	Riparian Zone	8	8	8	8
	Bank Stability	1	6	6	5
	Water Appearance	9	9	9	9
	Nutrient Enrichment	9	9	9	9
	Barriers to Fish Movement	10	10	10	10
	Instream Fish Cover	5	5.5	5	5
	Pools	4	7	7	5
	Invertebrate Habitat	6	6	6.5	6
	Canopy Cover	7	7	7	7
	Riffle Embeddedness	7	7	7.5	7
	Final Score	**5.9**	**6.9**	**7**	**6.5**
Bronxville Lake	Channel Condition	1	7	6	6
	Hydrologic Alteration	3	5	4	3
	Riparian Zone	1	8	4	2
	Bank Stability	5	7	5	5
	Water Appearance	7	7	7	7
	Nutrient Enrichment	5	6.5	5.5	5

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 20	B Yr 20	C Yr 20
	Barriers to Fish Movement	5	8	8	9
	Instream Fish Cover	1	5	3	3
	Pools	2	3	6	8
	Invertebrate Habitat	3	5	5	4
	Canopy Cover	1	3	2	1
	Manure Presence	1	5	3	2
	Final Score	**2.9**	**5.8**	**4.9**	**4.6**
Crestwood Lake	Channel Condition	7	9	7	7
	Hydrologic Alteration	3	7	7	7
	Riparian Zone	5	8	6	5.5
	Bank Stability	5	7	5	6
	Water Appearance	7	7	7	7
	Nutrient Enrichment	7	7	7	7
	Barriers to Fish Movement	1	5	5	7
	Instream Fish Cover	3	4	4	5
	Pools	2	5	4	7
	Invertebrate Habitat	3	4	4	4
	Canopy Cover	1	3	1	1
	Manure Presence	1	5	1	1
	Final Score	**3.8**	**5.9**	**4.8**	**5.4**
Harney Road	Channel Condition	3	8	7	4
	Hydrologic Alteration	1	4	2	1
	Riparian Zone	7	8.5	7.5	7.5
	Bank Stability	7	8.5	7.5	7.5
	Water Appearance	7	7	7	7
	Nutrient Enrichment	8	8	8	8
	Barriers to Fish Movement	1	3	3	6
	Instream Fish Cover	3	5	3	3
	Pools	3	7	6	4
	Invertebrate Habitat	3	3.5	3.5	3
	Canopy Cover	1	1	1	1
	Final Score	**4**	**5.8**	**5**	**4.7**
Garth Woods	Channel Condition	5	5	N/A	N/A
	Hydrologic Alteration	3	3		
	Riparian Zone	5	6		
	Bank Stability	7	7		

Sites	Metrics	Existing Conditions	Alternatives		
			A Yr 20	B Yr 20	C Yr 20
	Water Appearance	8	8		
	Nutrient Enrichment	10	10		
	Barriers to Fish Movement	3	3		
	Instream Fish Cover	5	5		
	Pools	7	7		
	Invertebrate Habitat	7	7		
	Canopy Cover	10	10		
	Riffle Embeddedness	8	8		
	Final Score	**6.5**	**6.6**	**N/A**	**N/A**
Westchester County Center	Channel Condition	5	7	7	7
	Hydrologic Alteration	5	7	7	7
	Riparian Zone	8	10	10	9
	Bank Stability	5	8	7	6
	Water Appearance	7	7	7	7
	Nutrient Enrichment	7	7	7	7
	Barriers to Fish Movement	10	10	10	10
	Instream Fish Cover	5	8	6	5
	Pools	3	7	7	3
	Invertebrate Habitat	3	5	3	3
	Canopy Cover	10	10	10	10
	Riffle Embeddedness	3	6	5	3
	Final Score	**5.9**	**7.7**	**7.2**	**6.4**

Chapter 12: EPW – Functional Capacity Units (FCUs)

Evaluation of Planned Wetland (EPW) scores were calculated for Alternatives A, B, and C for the five (5) functions including shoreline bank erosion control (SB), sediment stabilization (SS), water quality (WQ), Wildlife (WL), Fish (FS), and Uniqueness/Heritage (UH) similar to the baseline conditions as outlined in Section 7. EPW scores were also calculated for Alternatives A, B and C for 2, 20, 50 years after construction (See Attachment A). For each alternative, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives. Rounding results in minor summation and multiplication variability of the presented data. The resulting FCUs for each alternative are compared to existing conditions to illustrate the predicted ecosystem benefits and thus ecological lift of the proposed alternative.

12.1 River Park/West Farm Rapids Park

Alternative A, which entails shoreline softening, emergent wetlands creation, channel modification with instream structures, bed restoration, and additional restoration measures, results in the highest FCUs (Table 12-1). Conversely Alternative C, which omits channel modification with instream structures, bed restoration, shoreline softening in concert with emergent wetland creation, and reduces the extent of shoreline softening and debris removal, has the lowest FCUs.

Table 12-1: Year 2 EPW Scores - River Park/West Farm Rapids Park

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.66	0.003	0.002	0.70	0.35	0.242	0.69	0.35	0.240	0.70	0.07	0.047
SS	0.51	0.003	0.002	0.67	0.35	0.231	0.67	0.35	0.231	0.53	0.07	0.035
WQ	0.40	0.003	0.001	0.46	0.35	0.161	0.46	0.35	0.161	0.36	0.07	0.024
WL	0.11	0.003	0.000	0.18	0.35	0.061	0.17	0.35	0.061	0.16	0.07	0.011
FS	0.26	0.003	0.001	0.54	0.35	0.184	0.53	0.35	0.184	0.44	0.07	0.030
TOTAL			0.006			0.879			0.877			0.147
For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alts. Rounding results in minor summation and multiplication variability of the presented data.												

12.2 Bronx Zoo and Dam

Alternative A, which entails channel modification, shoreline softening, installation of a fish ladder, creation of emergent and forested wetlands, and additional restoration measures results in the highest FCUs (Table 12-2). Conversely Alternative C, which incorporates less extensive emergent wetland creation, no forested wetland creation, omits channel modification and shoreline softening, has the lowest FCUs.

Table 12-2: Year 2 EPW Scores - Bronx Zoo and Dam

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.35	0.43	0.152	0.53	1.45	0.77	0.52	1.17	0.61	0.35	0.97	0.34
SS	0.63	0.43	0.271	0.84	1.45	1.22	0.84	1.17	0.99	0.77	0.97	0.74
WQ	0.36	0.43	0.153	0.43	1.45	0.63	0.43	1.17	0.50	0.42	0.97	0.41
WL	0.22	0.43	0.095	0.34	1.45	0.49	0.26	1.17	0.31	0.25	0.97	0.24
FS	0.37	0.43	02.11.159	0.41	1.45	0.60	0.41	1.17	0.48	0.39	0.97	0.38
TOTAL			0.83			3.71			2.89			2.11
For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives. Rounding results in minor summation and multiplication variability of the presented data.												

12.3 Stone Mill Dam

As noted in Section 5.2.3, wetlands at the Stone Mill Dam site are practically non-existent and consist only of a few, very small pockets of emergent vegetation. Because they are formed in isolated patches of sediment on the shore, comprised otherwise of bedrock and boulders, of a comparatively swift flowing segment of the river, these discontinuous pocket wetlands are expected to be impermanent. They are likely being washed out by high flows or desiccated during lower flows, while other small wetland patches appear and disappear elsewhere along the river segment.

EPW functional capacity indices were estimated for Alternatives A, B, and C for 2, 20, 50 years after construction (Table 12-3); however, because of the very small size and the expected ephemeral presence of the wetlands on the site, EPW FCUs scores were not calculated.

Table 12-3: Year 2 EPW Scores - Stone Mill Dam

Function	Existing Conditions WAA	Alt A	Alt B	Alt C
	FCI	FCI	FCI	FCI
SB	0.32	0.80	0.80	0.80
SS	0.16	0.56	0.56	0.56
WQ	0.28	0.39	0.38	0.46
WL	0.15	0.12	0.12	0.12
FS	0.35	0.58	0.61	0.58

For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization.
Uniqueness/Heritage scores are 1.0 for all alternatives.
Rounding results in minor summation and multiplication variability of the presented data.

12.4 Shoelace Park

Alternative A, which entails forested and scrub/shrub wetlands creation, bank stabilization, channel realignment and modification with instream structures, and additional restoration measures, results in the highest FCUs (Table 12-4). Conversely Alternative C, which omits forested and scrub/shrub wetlands creation, and channel realignment and modification, has much lower FCUs.

Table 12-4: Year 2 EPW Scores - Shoelace Park

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs*	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.32	0.02	0.006	0.70	2.98	2.084	0.71	0.22	0.157	0.61	0.21	0.126
SS	0.16	0.02	0.003	0.86	2.98	2.553	0.86	0.22	0.189	0.48	0.21	0.099
WQ	0.28	0.02	0.006	0.40	2.98	1.183	0.40	0.22	0.088	0.33	0.21	0.068
WL	0.15	0.02	0.003	0.27	2.98	0.812	0.24	0.22	0.053	0.24	0.21	0.049
FS	0.35	0.02	0.007	0.70	2.98	2.084	0.48	0.22	0.107	0.48	0.21	0.098
TOTAL			0250.			8.716			0.594			0.44

For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives.
Rounding results in minor summation and multiplication variability of the presented data.

12.5 Muskrat Cove

Alternative B, which entails shoreline softening, bank stabilization, channel modification with instream structures, bed restoration, and additional restoration measures, results in the highest overall FCUs (Table 12-5). Alternative A, which utilizes channel modification in a river segment where Alternative B utilizes bed restoration, has comparable, albeit somewhat lower FCUs overall. Alternative C, which omits shoreline softening, channel modification, and bed restoration, has the lowest FCUs.

Table 12-5: Year 2EPW Scores - Muskrat Cove

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs*	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.55	0.02	0.011	0.74	0.63	0.468	0.74	0.63	0.468	0.59	0.04	0.022
SS	0.53	0.02	0.011	0.67	0.63	0.420	0.67	0.63	0.420	0.67	0.04	0.024
WQ	0.34	0.02	0.007	0.38	0.63	0.240	0.46	0.63	0.290	0.37	0.04	0.014
WL	0.11	0.02	0.002	0.23	0.63	0.143	0.19	0.63	0.120	0.19	0.04	0.007
FS	0.44	0.02	0.009	0.55	0.63	0.348	0.55	0.63	0.348	0.45	0.04	0.017
TOTAL			0.04			1.619			1.646			0.084
For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives. Rounding results in minor summation and multiplication variability of the presented data.												

12.6 Bronxville Lake

Alternative A, which entails forested and scrub/shrub wetland creation, emergent wetland creation, channel realignment with instream structures, and additional restoration measures, results in the highest FCUs (Table 12-6). Conversely Alternative C, which substantially restricts the extent of wetland creation, and will dredge and restore the lake bed, has the lowest FCUs.

Table 12-6: Year 2 EPW Scores - Bronxville Lake

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs*	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.54	0.30	0.162	0.92	4.92	4.511	0.90	3.57	3.225	0.75	1.01	0.755
SS	0.53	0.30	0.159	0.82	4.92	4.012	0.82	3.57	2.935	0.58	1.01	0.580
WQ	0.51	0.30	0.154	0.84	4.92	4.123	0.80	3.57	2.855	0.60	1.01	0.603
WL	0.23	0.30	0.070	0.41	4.92	2.024	0.41	3.57	1.456	0.37	1.01	0.371
FS	0.43	0.30	0.128	0.53	4.92	2.626	0.43	3.57	1.517	0.59	1.01	0.598
TOTAL			0.673			17.296			11.988			2.907
For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives. Rounding results in minor summation and multiplication variability of the presented data.												

12.7 Crestwood Lake

Alternative A, which entails invasive species removal with select native plantings, emergent wetland creation, forebay construction, channel realignment with instream structures, and additional restoration measures, results in the highest FCUs (Table 12-7). Conversely Alternative C, which substantially restricts the extent of wetland creation, and will dredge lake bed sediments, has much lower FCUs.

Table 12-7: Year 2 EPW Scores - Crestwood Lake

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs*	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.85	2.00	1.700	0.95	6.28	5.966	0.95	2.44	2.317	0.96	1.79	1.715
SS	0.57	2.00	1.130	0.87	6.28	5.448	0.82	2.44	1.987	0.67	1.79	1.193
WQ	0.57	2.00	1.142	0.81	6.28	5.087	0.62	2.44	1.512	0.57	1.79	1.022
WL	0.35	2.00	0.696	0.60	6.28	3.799	0.35	2.44	0.848	0.35	1.79	0.627
FS	0.36	2.00	0.717	0.67	6.28	4.222	0.38	2.44	0.935	0.49	1.79	0.877
TOTAL			5.385			20.3			7.599			5.434
For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives. Rounding results in minor summation and multiplication variability of the presented data.												

12.8 Harney Road

Alternative A, which entails channel modification with instream structures, weir modification, select native plantings, culvert construction, emergent wetland creation, and additional restoration measures, results in the highest FCUs (Table 12-8). Conversely Alternative C, which will not modify the river channel, substantially restricts the extent of wetland creation, and expands select native plantings, has the lowest FCUs.

Table 12-8: Year 2 EPW Scores Harney Road

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs*	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.55	0.60	0.332	0.94	1.62	1.511	0.75	1.02	0.766	0.75	1.02	0.766
SS	0.11	0.60	0.066	0.76	1.62	1.224	0.87	1.02	0.882	0.69	1.02	0.698
WQ	0.28	0.60	0.165	0.69	1.62	1.115	0.55	1.02	0.559	0.54	1.02	0.549
WL	0.17	0.60	0.104	0.39	1.62	0.622	0.39	1.02	0.392	0.30	1.02	0.307
FS	0.43	0.60	0.260	0.66	1.62	1.059	0.85	1.02	0.864	0.66	1.02	0.666
TOTAL			0.927			5.531			3.463			2.986
For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives. Rounding results in minor summation and multiplication variability of the presented data.												

12.9 Garth Woods

Alternative A, which entails forested and scrub/shrub wetland creation, select native plantings, and invasive species removal with native plantings, results in the FCUs presented in Table 12-9. Note the benefits of the restoration conducted by Westchester County are not considered. However, the synergistic effect of the restorative actions planned by Westchester County, when completed, would provide further ecological uplift to the project area, especially the reconfiguring of the river away from the Bronx River Parkway and allowing for a wooded buffer on both side of the waterbody.

Table 12-9: Year 2 EPW Scores - Garth Woods

Function	Existing Conditions WAA			Alt A		
	FCI	AREA	FCUs*	FCI	AREA	FCUs
SB	0.46	0.20	0.092	0.68	0.26	0.180
SS	0.10	0.20	0.020	0.18	0.26	0.048
WQ	0.44	0.20	0.088	0.59	0.26	0.157
WL	0.23	0.20	0.046	0.40	0.26	0.106
FS	0.39	0.20	0.078	0.39	0.26	0.103
TOTAL			0.324			0.594

For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization.
Uniqueness/Heritage scores are 1.0 for all alternatives.
Rounding results in minor summation and multiplication variability of the presented data.

12.10 Westchester County Center

Alternative A, which entails channel realignment with instream structures, emergent wetland creation, select native plantings, and additional restoration measures, results in the highest FCUs (Table 12-10). Conversely Alternative C, which will not realign the river channel, substantially restricts the extent of emergent wetland creation, and expands select native plantings, has much lower FCUs.

Table 12-10: Year 2 EPW Scores - Westchester County Center

Function	Existing Conditions WAA			Alt A			Alt B			Alt C		
	FCI	AREA	FCUs*	FCI	AREA	FCUs	FCI	AREA	FCUs	FCI	AREA	FCUs
SB	0.53	2.00	1.057	0.89	5.36	4.757	0.89	3.89	3.479	0.73	3.87	2.802
SS	0.14	2.00	0.280	0.95	5.36	5.092	0.84	3.89	3.260	0.47	3.87	1.812
WQ	0.30	2.00	0.609	0.61	5.36	3.256	0.46	3.89	1.791	0.41	3.87	1.585
WL	0.15	2.00	0.304	0.53	5.36	2.830	0.38	3.89	1.488	0.24	3.87	0.932
FS	0.45	2.00	0.900	0.69	5.36	3.723	0.86	3.89	3.352	0.86	3.87	3.328
TOTAL			3.15			19.658			13.37			10.459

For alternatives, it was assumed that the wetlands would form in 10 percent of the mapped polygons identified for bank stabilization. Uniqueness/Heritage scores are 1.0 for all alternatives.
Rounding results in minor summation and multiplication variability of the presented data.

Chapter 13: Average Annual Functional Capacity Units (AAFCUs)

AAFCUs for each site and each of the alternatives are presented in Attachment B. AAFCUs were calculated for Years 2, 20, and 50. For Year 2, it was assumed that the Bronx River sites, which are all riparian and not subject to tidal influences, would realize all 5 functions by end of year one. For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1. For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion. Year 50 AAFCU results are provided below in Table 13-1. The total AAFCU scores were calculated using the formula presented in the text below. Once the AAFCU scores were calculated, they were summed, per alternative. These scores quantify the ecological benefits that were analyzed in as part of the ecological

benefits and costs for each alternative for each site presented in Chapter 3 of the main report. All AAFCU calculations are provided in Attachment B to this Appendix.

The following calculations were used:

AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[(((A1*F1) +(A2*F2) / 3) + (((A2*F1) +(A1*F2)) / 6)] and where:
T1 = First Target Year time interval;
T2 = Second Target Year time interval;
A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2;
F1 = FCI at beginning of T1;
F2 = FCI at end of T2
*Rounding results in minor summation and multiplication variability of the presented data.

Table 13-1: 50 Year AAFCU Calculation Results

Wetland Function	River Park/West Farm Rapids Park			Bronx Zoo and Dam			Stone Mill Dam		
	A	B	C	A	B	C	A	B	C
SB	0.112	0.11	0.02	0.406	0.340	0.233	0.000	0.000	0.000
SS	0.1	0.1	0.02	0.669	0.568	0.468	0.000	0.000	0.000
WQ	0.072	0.07	0.01	0.355	0.302	0.259	0.000	0.000	0.000
WL	0.025	0.03	0	0.258	0.184	0.157	0.000	0.000	0.000
FS	0.071	0.07	0.01	0.350	0.298	0.252	0.000	0.000	0.000
AAFCU Total	0.380	**0.379**	0.069	2.038	1.692	**1.369**	0.000	0.000	0.000
Wetland Function	**Shoelace Park**			**Muskrat Cove**			**Bronxville Lake**		
	A	B	C	A	B	C	A	B	C
SB	0.802	0.121	0.103	0.217	0.217	0.025	1.909	1.396	0.408
SS	0.874	0.129	0.074	0.198	0.198	0.027	1.742	1.296	0.343
WQ	0.506	0.075	0.063	0.117	0.134	0.016	1.762	1.259	0.347
WL	0.305	0.042	0.040	0.060	0.052	0.007	0.849	0.623	0.192
FS	0.817	0.095	0.084	0.165	0.165	0.020	1.207	0.768	0.323
AAFCU Total	**3.304**	0.462	0.364	**0.757**	0.766	0.095	7.469	**5.342**	1.613
Wetland Function	**Crestwood Lake**			**Harney Road**			**Westchester County Center**		
	A	B	C	A	B	C	A	B	C
SB	3.545	1.906	1.637	0.934	0.634	0.634	2.551	2.038	1.771
SS	2.894	1.466	1.114	0.586	0.481	0.406	2.099	1.463	0.892
WQ	2.772	1.261	1.035	0.651	0.440	0.435	1.666	1.090	1.009
WL	1.943	0.736	0.633	0.384	0.296	0.278	1.276	0.778	0.559
FS	2.113	0.785	0.766	0.672	0.590	0.510	2.050	1.890	1.881
AAFCU Total	**13.267**	6.154	5.185	**3.227**	2.442	2.263	9.642	**7.259**	6.112

Note: The shaded Alternative is the TSP.

Wetlands at the Stone Mill Dam site are practically non-existent and consist only of a few, very small pockets of emergent vegetation. Because they are formed in isolated patches of sediment on the shore, comprised otherwise of bedrock and boulders, of a comparatively swift flowing segment of the river, these discontinuous pocket wetlands are expected to be impermanent. They are likely being washed out by high flows or desiccated during lower flows, while other small wetland patches appear and disappear elsewhere along the river segment. EPW FCIs were estimated for Alternatives A, B, and C for one (1) year after construction and 20 years in the future (Table 12-3); however, because of the very small size and the expected ephemeral presence of the wetlands on the site, EPW scores were not calculated. For most of the other sites' alternatives, there were limited changes between the Year 20 and Year 50 AAFCUs.

Chapter 14: Tentatively Selected Plan

A Tentatively Selected Plan (TSP) was chosen for each Bronx River site. In order to choose a TSP, cost effectiveness and incremental cost analyses (CE/ICA) for each site was conducted using inputs of AAFCUs and project first level costs (Appendix M). Typically, the most cost effective Best Buy Plan was selected as the TSP for each site.

14.1 River Park/West Farm Rapids Park

Alternative B was chosen as the River Park/West Farm Rapids Park TSP. Alternative B restoration measures increase/improve wetlands, public access, shoreline and shallows and habitat for fish, crabs and lobster. The created wetlands will provide important habitats for migratory birds in a dense urban setting and increase flood control at the site. The TSP will provide increased native biodiversity though wetland creation and targeted reduction of invasive plant species. River Park/West Farms Rapid Park will experience improved aquatic habitat, hydrologic flow regime and water quality with the implantation of Alternative B. The ecological enhancements will increase user experience of park.

14.2 Bronx Zoo and Dam

Alternative C was chosen as the TSP for Bronx Zoo and Dam. The TSP restoration measures will improve aquatic habitat and water quality. Created wetlands will provide habitats for migratory birds and flood control. The created forested wetlands may provide potential habitat and roosting resources for endangered bat species, if present. Improved fish connectivity will provide access for anadromous species. Removal of invasive species and creation of wetlands will provide increased native biodiversity for the site. Public access to the site will be improved with Alternative C.

14.3 Stone Mill Dam

Alternative A was chosen as the TSP for Stone Mill Dam. The TSP increases/improves tributary connections, shoreline and shallows, and habitats for fish, crab and lobsters. The Stone Mill Dam fish ladder is a critical component of the fish passage projects along the Bronx River which will complement downstream fish ladder projects in order to expand fish passage and provide additional upstream habitat for anadromous fish. The TSP will also provide a reduction to invasive plant species at the site.

14.4 Shoelace Park

Alternative A was chosen as the TSP for Shoelace Park. The selected TSP increases/improves wetlands, public access, shoreline and shallows, and habitat for fish, crab and lobsters. Alternative A will improve aquatic habitat and water quality by modifying the channel with instream structures, restoration of natural pools, thawleg and riffle complexes. Invasive species located on site will be reduced and select native plantings will provide wooded riparian corridor along the backs of the entire reach. The riparian woodlands and restored forested wetlands would provide habitat resources that are currently very limited in the Bronx urban environment and reduce nutrient inputs to the water.

14.5 Muskrat Cove

The Muskrat Cove TSP was chosen as Alterative A. The selected TSP increases/improves wetlands, public access, shoreline and shallows, and habitat for fish, crab and lobsters. Muskrat Cove restoration measures were designed to act in concert with future Parks Department activities. Alternative A will

improve aquatic habitat and water quality as well as improve flow regime. Invasive species located on site will also be reduced. Due to the proximity of major arterial infrastructure, shorelines were engineered with excessive armor of concrete. Restoration efforts were designed to retain structural integrity yet provide some opportunity for vegetative growth.

14.6 Bronxville Lake

Alternative B was chosen as the Bronxville Lake TSP. The selected alternative will improve aquatic habitat and water quality. Improved flow regime and improved fish connectivity will provide access for anadromous species. Created wetlands will provide important habitats for migratory birds and increased flood control. Increased native biodiversity through wetlands creation and targeted removal of invasive plant species. Created forested wetlands have the potential to provide habitat/roosting resource for endangered bat species, if present. Public access will also be improved with the implementation of Alternative B.

14.7 Crestwood Lake

Alternative A was chosen as the Crestwood Lake TSP. Wetland creations, planting and targeted reduction of invasive species at Crestwood Lake will provide increased biodiversity. Created forested uplands will provide habitat for endangered species. The selected alternative will improve flow regime for Crestwood Lake. Improvements to fish connectivity will allow access for anadromous species. The TSP will also increase flood control though wetland creation and improve public access.

14.8 Garth Woods/Harney Road

Alternative A-2 for Garth Woods and Alternative A for Harney Road were chosen as the TSP. The alternatives were designed to complement future habitat enhancements at Garth Woods to be performed by Westchester County. The restoration actions were designed to act in concert with viewscapes of the Bronx River Parkway. Created forested wetlands may provide potential habitat/roosting resources for endangered bat species, if present. Wetland creation will provide increased native biodiversity and improved aquatic habitat and water quality. Increased flood control is a secondary benefit wetland creation will provide. Reduction of native species will also occur with the implantation of the TSP at Garth Woods/Harney Road site.

14.9 Westchester County Center

The Westchester County TSP was chosen as Alternative B. Alternative B increases/improves wetlands, tributary connection, public access, shoreline and shallows, and habitats for fish, crabs and lobsters. The proposed restoration measures were designed to act in concert with viewscapes of the Bronx River Parkway. When implemented the TSP will provide improved habitat quality and water quality, improved flow regime and improvements to public access. Wetland creation will increase native biodiversity and increase flood control value. Created forested wetlands may provide habitat/roosting resource for endangered bat species, if present.

References

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Attachment A
EPW Summary Sheets

River Park/West Farm Rapids Park

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.66	0.00	0.002	0.69	1	0.0020	0.69	0.0029	0.70	0.35	0.242	Y
SS	0.51	0.00	0.002	0.53	1	0.0015	0.53	0.0029	0.67	0.35	0.231	Y
WQ	0.40	0.00	0.001	0.40	1	0.0012	0.40	0.0030	0.46	0.35	0.161	Y
WL	0.11	0.00	0.000	0.15	1	0.0003	0.15	0.0022	0.18	0.35	0.061	Y
FS	0.26	0.00	0.001	0.40	1	0.0008	0.40	0.0019	0.53	0.35	0.184	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
		(6)	Boat Traffic
N/A	N/A		
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(8a)	Hours of sunlight
0.1	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.1	1.0	(10g)	Plant height
0.1	0.8	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

→ 3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.4 / 0.6

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.3 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.7 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title:Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Sediment Stabilization

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.5	/	N/A	(4a)	Disturbance at site
N/A	/	N/A	(7a)	Water level fluctuation
0.1	/	0.3	(10b)	Plant (basal) cover
0.1	/	0.3	(10c)	Leaf litter and debris cover
0.1	/	0.5	(10j)	Root structure
0.1	/	1.0	(10l)	Vegetation Persistence
1.0	/	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title:Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Water Quality

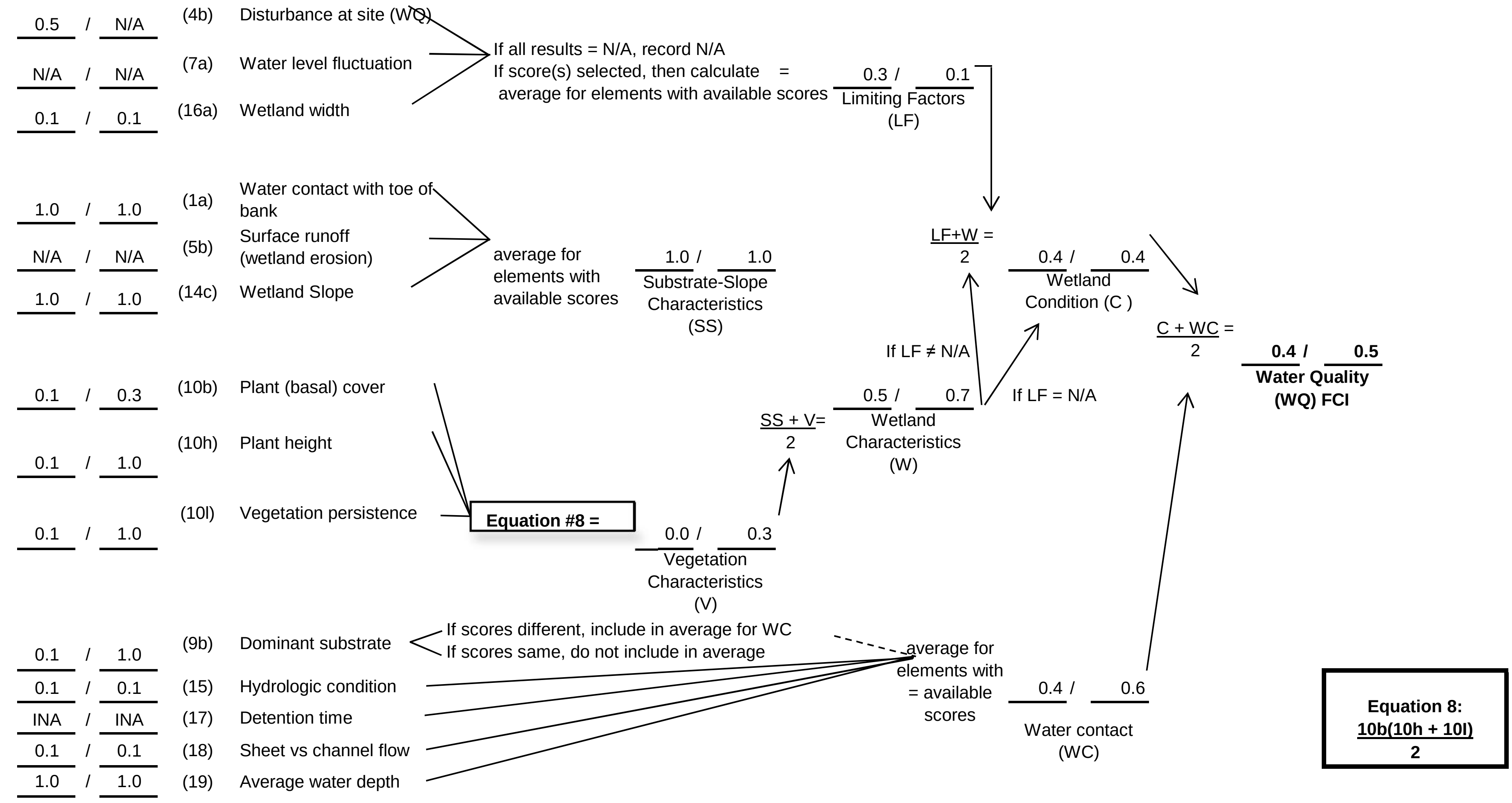
Selected Scores		(#)	Element

Comparison:____________________________ / ____________________________ (e.g., WAA/planned wetland)

0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



0.5 / N/A (4b) Disturbance at site (WQ)

N/A / N/A (7a) Water level fluctuation

0.1 / 0.1 (16a) Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = 0.3 / 0.1 Limiting Factors (LF)
average for elements with available scores

1.0 / 1.0 (1a) Water contact with toe of bank

N/A / N/A (5b) Surface runoff (wetland erosion)

1.0 / 1.0 (14c) Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

0.1 / 0.3 (10b) Plant (basal) cover

0.1 / 1.0 (10h) Plant height

0.1 / 1.0 (10l) Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.4 Wetland Condition (C)

If LF = N/A

0.1 / 1.0 (9b) Dominant substrate

If scores different, include in average for WC
If scores same, do not include in average

0.1 / 0.1 (15) Hydrologic condition

INA / INA (17) Detention time

0.1 / 0.1 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.5**
Water Quality (WQ) FCI

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Wildlife

Comparison:__________________________________ / __________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.3 / 0.7	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.7
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

Selected Scores	(#)	Element
N/A / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.1 / 0.3
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.1 / 0.2**
Wildlife FCI

If F = NA

`

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat
if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A	N/A	(1b)	Shoreline bank stability
0.5	N/A	(4a)	Disturbance at site (SS)
0.1	0.5	(4d)	Disturbance in channel/open water
0.1	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.233 / 0.5 Limiting Factors

Selected Scores		(#)	Element
N/A	0.5	(10m)	Vegetative overhang
0.1	0.3	(10o)	Plant biomass
0.1	0.5	(21b)	Shape of wetland/water edge
0.1	0.3	(22b)	Available fish cover/attractors
0.1	0.5	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.1 / 0.4 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ
If information not available, continue

Selected Scores		(#)	Element
0.1	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.3 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
			Comparison:________________________________ (e.g., WAA/planned wetland)
Site Suitability For Planned Wetland:			
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore
~~N/A~~	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
0.1	0.1	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.3
Physical Influences on Rate of Erosion

Equation #6 = 0.2 / #####
Vegetation influences on Rate of Erosion

average for available scores = **0.3 /** **#####**
Influences on Rate of Erosion (I)

E + I =
2
~~N/A~~ / ~~N/A~~
Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	0.1	(14c)	Wetland slope

(4a), (7a): if ~~both~~ 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.3
Vegetation Characteristics (V)

(14c): = 0.1 / 0.1
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.2
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.2**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 2

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2**

If F = NA: **0.2 / 0.2**

Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.66	0.00	0.002	0.69	1	0.0020	0.69	0.0029	0.69	0.35	0.240	Y
SS	0.51	0.00	0.002	0.53	1	0.0015	0.53	0.0029	0.67	0.35	0.231	Y
WQ	0.40	0.00	0.001	0.40	1	0.0012	0.40	0.0030	0.46	0.35	0.161	Y
WL	0.11	0.00	0.000	0.15	1	0.0003	0.15	0.0022	0.17	0.35	0.061	Y
FS	0.26	0.00	0.001	0.40	1	0.0008	0.40	0.0019	0.53	0.35	0.184	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles

→ 3= 0.5 / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(8a)	Hours of sunlight
0.1	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.4 / 0.6

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.1	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.3 / 0.4

Influences on Rate of Erosion (I)

$$\frac{E + I}{2} =$$ **0.7 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5 / N/A (4b) Disturbance at site (WQ)

N/A / N/A (7a) Water level fluctuation

0.1 / 0.1 (16a) Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.3 / 0.1 Limiting Factors (LF)

1.0 / 1.0 (1a) Water contact with toe of bank

N/A / N/A (5b) Surface runoff (wetland erosion)

1.0 / 1.0 (14c) Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

0.1 / 0.3 (10b) Plant (basal) cover

0.1 / 1.0 (10h) Plant height

0.1 / 1.0 (10l) Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.4 Wetland Condition (C)

If LF = N/A

0.1 / 1.0 (9b) Dominant substrate

If scores different, include in average for WC
If scores same, do not include in average

0.1 / 0.1 (15) Hydrologic condition

INA / INA (17) Detention time

0.1 / 0.1 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with available scores = 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.5 Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.3 / 0.7	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

Selected Scores	(#)	Element
N/A / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.1 / 0.2 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element	Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

N/A	N/A	(1b)	Shoreline bank stability	
0.5	N/A	(4a)	Disturbance at site (SS)	
0.1	0.5	(4d)	Disturbance in channel/open water	
0.1	N/A	(16c)	Fish habitat size	
N/A	N/A	(24)	Obstruction to fish passage	

average for elements with available scores = 0.233 / 0.5 Limiting Factors

N/A	0.5	(10m)	Vegetative overhang
0.1	0.3	(10o)	Plant biomass
0.1	0.5	(21b)	Shape of wetland/water edge
0.1	0.3	(22b)	Available fish cover/attractors
0.1	0.5	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.1 / 0.4 Food/Cover

N/A	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

0.5	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

0.1	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.3 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
0.1	0.1	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.3

Physical Influences on Rate of Erosion

Equation #6 = 0.2 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.3 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

~~10a (10g + 10i + 10k)~~

~~32~~

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

N/A / N/A (4a) Disturbance at site

~~N/A~~ / ~~N/A~~ (7a) Water level fluctuation

if ~~both~~ 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance
Factors (DF)

0.3 / 0.3 (10b) Plant (basal) cover

0.1 / 0.1 (10c) Leaf litter and debris cover

0.5 / 0.5 (10j) Root structure

1.0 / 1.0 (10l) Vegetation Persistence

Equation #7 = 0.3 / 0.3
Vegetation
Characteristics
(V)

0.1 / 0.1 (14c) Wetland slope

= 0.1 / 0.1
Slope Stability
(S)

$\frac{V+S}{2}$ = 0.2 / 0.2
Wetland
Characteristics
(W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.2 / 0.2**
Sediment
Stabilization
FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 2

Calculation of Wildlife (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: Habitat Complexity (HC) → **Wildlife FCI**

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.66	0.00	0.002	0.69	1	0.0020	0.69	0.0029	0.70	0.07	0.047	Y
SS	0.51	0.00	0.002	0.53	1	0.0015	0.53	0.0029	0.53	0.07	0.035	Y
WQ	0.40	0.00	0.001	0.40	1	0.0012	0.40	0.0030	0.36	0.07	0.024	Y
WL	0.11	0.00	0.000	0.15	1	0.0003	0.15	0.0022	0.16	0.07	0.011	Y
FS	0.26	0.00	0.001	0.40	1	0.0008	0.40	0.0019	0.44	0.07	0.030	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(8a)	Hours of sunlight
0.1	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.1	1.0	(10g)	Plant height
0.1	1.0	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

(3) → 3= 0.5 / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.4 / 0.6

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.0 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.3 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.7 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
			Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)
0.5	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.1	0.1	(10j)	Root structure
0.1	0.1	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.1
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.5
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.5**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores =

0.3 / 0.1
Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores

1.0 / 1.0
Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.1	(10b)	Plant (basal) cover
0.1	1.0	(10h)	Plant height
0.1	0.1	(10l)	Vegetation persistence

Equation #8 =

0.0 / 0.1
Vegetation Characteristics (V)

SS + V= / 2

0.5 / 0.5
Wetland Characteristics (W)

If LF ≠ N/A

LF+W = / 2

If LF = N/A

0.4 / 0.3
Wetland Condition (C)

Selected Scores		(#)	Element
0.1	0.1	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4
Water contact (WC)

C + WC = / 2

0.4 / 0.4
Water Quality (WQ) FCI

Equation 8:
10b(10h + 10l)
2

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.3 / 0.5	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
N/A / N/A	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.2 / 0.6 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.2 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.1 / 0.2 Wildlife FCI**

If F = NA: **Wildlife FCI** = HC

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:__________ / __________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element	
N/A /	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element			
N/A /	N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.233 / 0.3	Limiting Factors
0.5 /	N/A	(4a)	Disturbance at site (SS)			
0.1 /	0.5	(4d)	Disturbance in channel/open water			
0.1 /	0.1	(16c)	Fish habitat size			
N/A /	N/A	(24)	Obstruction to fish passage			
N/A /	0.1	(10m)	Vegetative overhang	average for elements with available scores	= 0.1 / 0.2	Food/Cover
0.1 /	0.1	(10o)	Plant biomass			
0.1 /	0.1	(21b)	Shape of wetland/water edge			
0.1 /	0.3	(22b)	Available fish cover/attractors			
0.1 /	0.5	(25a)	% pool area			
N/A /	N/A	(26)	Bank account			
N/A /	N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.2 / 0.8	Reproduction
0.2	0.5	(27a)	Spawning substrate			
N/A	1.0	(27b)	Spawning structures			
0.5 /	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue		
0.1 /	INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5	Water Quality (WQ)
INA /	INA	(20d)	Dissolved Oxygen			
INA /	INA	(20e)	pH			
INA /	INA	(20f)	Maximum water temperature			
INA /	INA	(20g)	Turbidity			

average for available scores = **0.3 /** **0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
0.1	0.1	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.3

Physical Influences on Rate of Erosion

Equation #6 = 0.2 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.3 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.3	0.3	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	0.1	(14c)	Wetland slope

if ~~both~~ 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.3
Vegetation Characteristics (V)

= 0.1 / 0.1
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.2
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.2**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 2

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

Bronx Zoo and Dam

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.53	1.45	0.768	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.84	1.45	1.219	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.43	1.45	0.627	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.34	1.45	0.497	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.41	1.45	0.594	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.5	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.3 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 / 0.5**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Sediment Stabilization

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.3 / 0.7	(10b)	Plant (basal) cover
0.1 / 0.3	(10c)	Leaf litter and debris cover
0.5 / 0.8	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

Comparison:__________ / __________ (e.g., WAA/planned wetland)

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation** = 0.3 / 0.7
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

$\frac{DF + W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.1 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A → $\frac{LF+W}{2}$ =

If LF = N/A →

0.3 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
N/A / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ)

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
1.0 / 1.0	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.9
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
0.1 / N/A	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 1.0	(23)	Islands

average for elements with available scores = 0.1 / 0.6
Physical Features

average for available scores = 0.3 / 0.6
Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ = **0.2 / 0.3**
Wildlife FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 / 0.5	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

0.5 / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / 0.5	Limiting Factors
N/A / N/A	(4a)	Disturbance at site (SS)			
N/A / N/A	(4d)	Disturbance in channel/open water			
N/A / N/A	(16c)	Fish habitat size			
0.5 / 0.5	(24)	Obstruction to fish passage			
0.1 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.4 / 0.5	Food/Cover
0.3 / 0.3	(10o)	Plant biomass			
0.5 / 0.5	(21b)	Shape of wetland/water edge			
0.3 / 0.8	(22b)	Available fish cover/attractors			
1.0 / 1.0	(25a)	% pool area			
0.1 / 0.1	(26)	Bank account			
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5	Reproduction
0.5 / 0.5	(27a)	Spawning substrate			
N/A / N/A	(27b)	Spawning structures			
INA / INA	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue		
0.1 / 0.1	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.1 / 0.1	Water Quality (WQ)
INA / INA	(20d)	Dissolved Oxygen			
INA / INA	(20e)	pH			
INA / INA	(20f)	Maximum water temperature			
INA / INA	(20g)	Turbidity			

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.2**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.5	(4a)	Disturbance at site
~~N/A~~ / ~~N/A~~	(7a)	Water level fluctuation
0.3 / 0.3	(10b)	Plant (basal) cover
0.7 / 0.7	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~ score from 4a ~~or 7a~~

= 0.1 / 0.5 Disturbance Factors (DF)

Equat = 0.5 / 0.5 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.4 / 0.6** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 2

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
1.0	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	0.1	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.9 / 0.5 Vegetation Strata

Selected Scores		(#)	Element
0.1	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
1.0	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.1 Physical Features

average for available scores = 0.6 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.4 / 0.4
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative B Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.52	1.17	0.605	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.84	1.17	0.983	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.43	1.17	0.506	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.26	1.17	0.304	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.41	1.17	0.479	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title:Site 861. Bronx Zoo Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A
Shoreline Structures /Obstacles

average for elements with available scores = 0.1 / 0.1
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.3 / 0.6
Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.3
Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.5**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title:Site 861. Bronx Zoo Alternative B Year 2

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation = 0.3 / 0.7
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.1 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores: 0.8 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A: 0.3 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
N/A / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.4 Water Quality (WQ) FCI**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title:Site 861. Bronx Zoo Alternative B Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element		
N/A	/	N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / 0.1 Features Which Reduce Habitat Value (F)
N/A	/	N/A	(20a)	Gross contamination		
0.1	/	0.1	(16b)	Wetland size		
1.0	/	1.0	(11a)	Layers	average for elements with available scores	= 0.7 / 0.7 Vegetation Strata
0.3	/	0.3	(11b)	Condition of Layers		
N/A	/	N/A	(11c)	Spatial pattern of shrubs/trees		
0.1	/	0.3	(12a)	Cover types	average for elements with available scores	= 0.3 / 0.4 Vegetation Cover Types
0.5	/	0.5	(12b)	Ratio of cover types		
0.5	/	0.5	(12c)	Cover type interspersion		
0.1	/	N/A	(12d)	Undesirable species		
0.5	/	0.5	(13a)	% open water	average for elements with available scores	= 0.3 / 0.5 Vegetation/ Water Proportions
0.1	/	0.5	(13b)	Vegetation/water interspersion		
0.1	/	0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.1 / 0.1 Physical Features
N/A	/	N/A	(22a)	Wildlife attractors		
0.1	/	0.1	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.3
Wildlife FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5	N/A	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.8	(22b)	Available fish cover/attractors
1.0	1.0	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
INA	INA	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
0.1	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Shoreline structures/obstacles → 3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.2**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title:Site 861. Bronx Zoo Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
0.1	/	0.5	(4a)	Disturbance at site
~~N/A~~	/	~~N/A~~	(7a)	Water level fluctuation
0.3	/	0.3	(10b)	Plant (basal) cover
0.7	/	0.7	(10c)	Leaf litter and debris cover
0.5	/	0.5	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
1.0	/	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.5
Disturbance Factors (DF)

Equat = 0.5 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.4 / 0.6**
Sediment Stabilization FCI

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 2

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
1.0 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 0.1	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.9 / 0.5 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.6 Physical Features

average for available scores = 0.6 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.4 / 0.5
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.35	0.97	0.341	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.77	0.97	0.744	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.42	0.97	0.405	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.25	0.97	0.238	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.39	0.97	0.374	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.5	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.5

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2)–(14b): average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

(10a)–(10k): **Equation #5 or #6** = 0.3 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.2

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.4**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Calculation of Sediment Stabilization

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation** = 0.3 / 0.5 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:_______________ / _______________ (e.g., WAA/planned wetland)
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.1	0.1	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1
Limiting Factors (LF)

Selected Scores		(#)	Element
0.5	0.5	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.8
Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.7
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.4
Wetland Condition (C)

Selected Scores		(#)	Element
N/A	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4
Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ) FCI

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Calculation of Wildlife

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
1.0 / 1.0	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.3 Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.2
Wildlife FCI

`

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:__________ / __________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5	0.5	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
1.0	1.0	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
INA	INA	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
0.1	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title:Site 861. Bronx Zoo Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title:Site 861. Bronx Zoo Alternative C Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.4**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1 /	0.1	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.1 / 0.1
Disturbance Factors (DF)

Equat = 0.5 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.4 / 0.4**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 2

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
1.0 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 0.1	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.9 / 0.5 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.5 / 1.0	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.7 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.6 Physical Features

average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ =

0.4 / 0.6
Wildlife FCI

Stone Mill Dam

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Comparison between WAA# and wetland # ______________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.39	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.58	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
N/A	/	N/A	(4a)	Disturbance at site
N/A	/	N/A	(7a)	Water level fluctuation
0.1	/	0.1	(10b)	Plant (basal) cover
0.1	/	0.1	(10c)	Leaf litter and debris cover
0.5	/	0.5	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
1.0	/	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.1
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Water Quality

Selected Scores			(#)	Element
				Comparison:________________ / ________________ (e.g., WAA/planned wetland)
0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores			(#)	Element
N/A	/	N/A	(4b)	Disturbance at site (WQ)
N/A	/	N/A	(7a)	Water level fluctuation
0.1	/	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores			(#)	Element
1.0	/	1.0	(1a)	Water contact with toe of bank
N/A	/	N/A	(5b)	Surface runoff (wetland erosion)
1.0	/	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores			(#)	Element
0.1	/	0.3	(10b)	Plant (basal) cover
0.5	/	1.0	(10h)	Plant height
1.0	/	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A: Wetland Condition (C)

Selected Scores			(#)	Element
0.5	/	0.5	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.1	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

Dominant substrate: If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.4 Water Quality (WQ) FCI**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.3 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.1 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.1 / 0.1**

If F = NA: **0.1 / 0.1**

Wildlife FCI

`

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

→ if result = 0.1, STOP. There is no potential for providing tidal fish habitat

→ if result ≠ 0.1 or N/A, then continue with model

N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

0.1 /	0.1	(10m)	Vegetative overhang
1.0 /	1.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

N/A /	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

0.5 /	0.5	(20b)	Water quality rating

→ If score available, record score for WQ

→ If information not available, continue

INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
#N/A /	#N/A	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
1.0	/	1.0	(32)	Historical or archaeological significance
1.0	/	1.0	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
1.0	/	1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$

Project Title: Site Site 863. Stone Mill Dam Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.7	1.0	(10b)	Plant (basal) cover
0.7	0.7	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Comparison between WAA# and wetland # ____________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.38	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.61	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A Shoreline Structures /Obstacles

(2)–(14b): average for elements with available scores = 1.0 / 1.0 Physical Influences on Rate of Erosion

(10a)–(10k): **Equation #5 or #6** = 0.2 / 0.2 Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

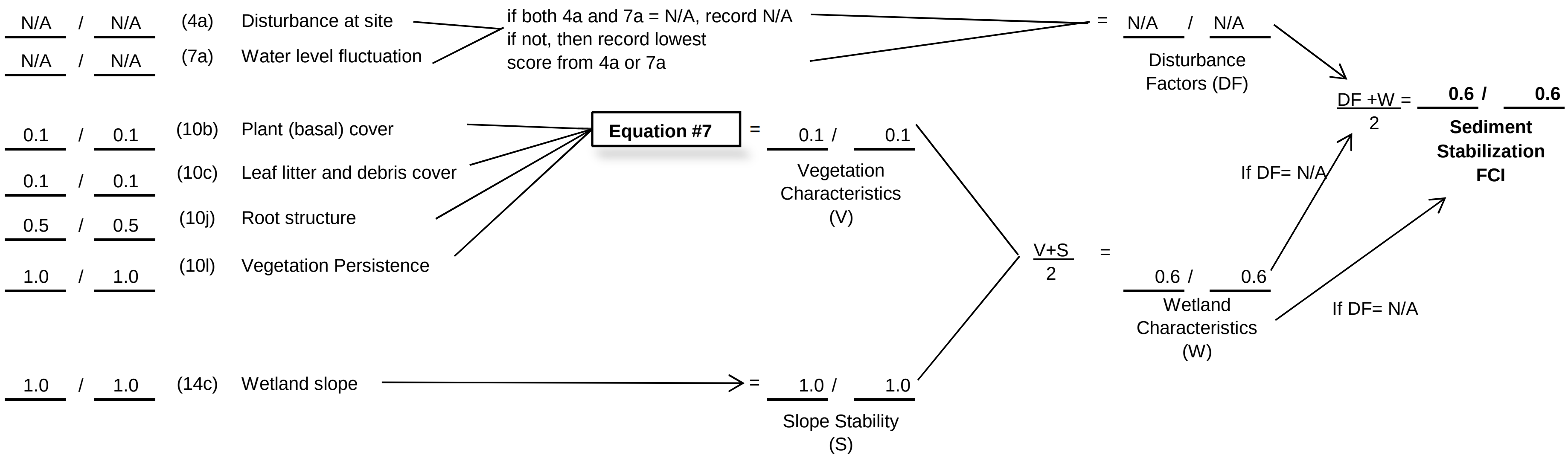
Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Sediment Stabilization

Comparison:____________________________ / ____________________________ (e.g., WAA/planned wetland)



Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(10b)	Plant (basal) cover
0.1 / 0.1	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.1
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.6**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Water Quality

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
N/A	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 0.5 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A

LF+W = / 2 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
0.5	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

C + WC = / 2 **0.4 / 0.4 Water Quality (WQ) FCI**

Equation 8:
10b(10h + 10l)
2

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.3 / 0.3 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features → average for available scores = 0.1 / 0.1 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.1 / 0.1 Wildlife FCI**

If F = NA: **Wildlife FCI** = HC

`

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
1.0 /	1.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
#N/A /	#N/A	(20f)	Maximum water temperature
#N/A /	#N/A	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
1.0 / 1.0	(32)	Historical or archaeological significance
1.0 / 1.0	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
1.0 / 1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
			Comparison:____ (e.g., WAA/planned wetland)
			Site Suitability For Planned Wetland:
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

~~E + I =~~
2
~~N/A~~ / ~~N/A~~

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +} 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.7	1.0	(10b)	Plant (basal) cover
0.7	0.7	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Comparison between WAA# and wetland # ____________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.46	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.58	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Shoreline structures/obstacles → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 /** **0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(10b)	Plant (basal) cover
0.1 / 0.1	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.1
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
N/A	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 0.5 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
0.5	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.6 Water contact (WC)

C + WC = / 2 **0.4 / 0.5 Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title:Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.3
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.1 / 0.1
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.1
Wildlife FCI

`

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element	
0.5 /	0.5	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
1.0 /	1.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores		(#)	Element	
0.5 /	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
#N/A /	#N/A	(20f)	Maximum water temperature
#N/A /	#N/A	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison: ____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
1.0 / 1.0	(32)	Historical or archaeological significance
1.0 / 1.0	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
1.0 / 1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

$\frac{10a\ (\cancel{10g +} 10i + 10k)}{\cancel{3}2}$

Project Title: Site 863. Stone Mill Dam Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.7	1.0	(10b)	Plant (basal) cover
0.7	0.7	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Shoelace Park

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative A Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.5	1	0.0064	0.5	0.01275	0.71	2.98	2.123	
SS	0.16	0.02	0.003	0.3	1	0.0032	0.3	0.010583	0.86	2.98	2.555	
WQ	0.28	0.02	0.006	0.4	1	0.0056	0.4	0.014115	0.40	2.98	1.183	
WL	0.15	0.02	0.003	0.2	1	0.003	0.2	0.014919	0.22	2.98	0.668	
FS	0.35	0.02	0.007	0.5	1	0.007	0.5	0.014	0.46	2.98	1.358	
UH	1.00			1					1.00			

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.1 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.7 Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8 Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.6 / 0.7 Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.3 /** **0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4a)	Disturbance at site
0.1 / N/A	(7a)	Water level fluctuation
0.3 / 0.7	(10b)	Plant (basal) cover
0.1 / 0.1	(10c)	Leaf litter and debris cover
1.0 / 1.0	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
0.1 / 1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / N/A Disturbance Factors (DF)

Equation #7 = 0.3 / 0.7 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.9**

Sediment Stabilization FCI

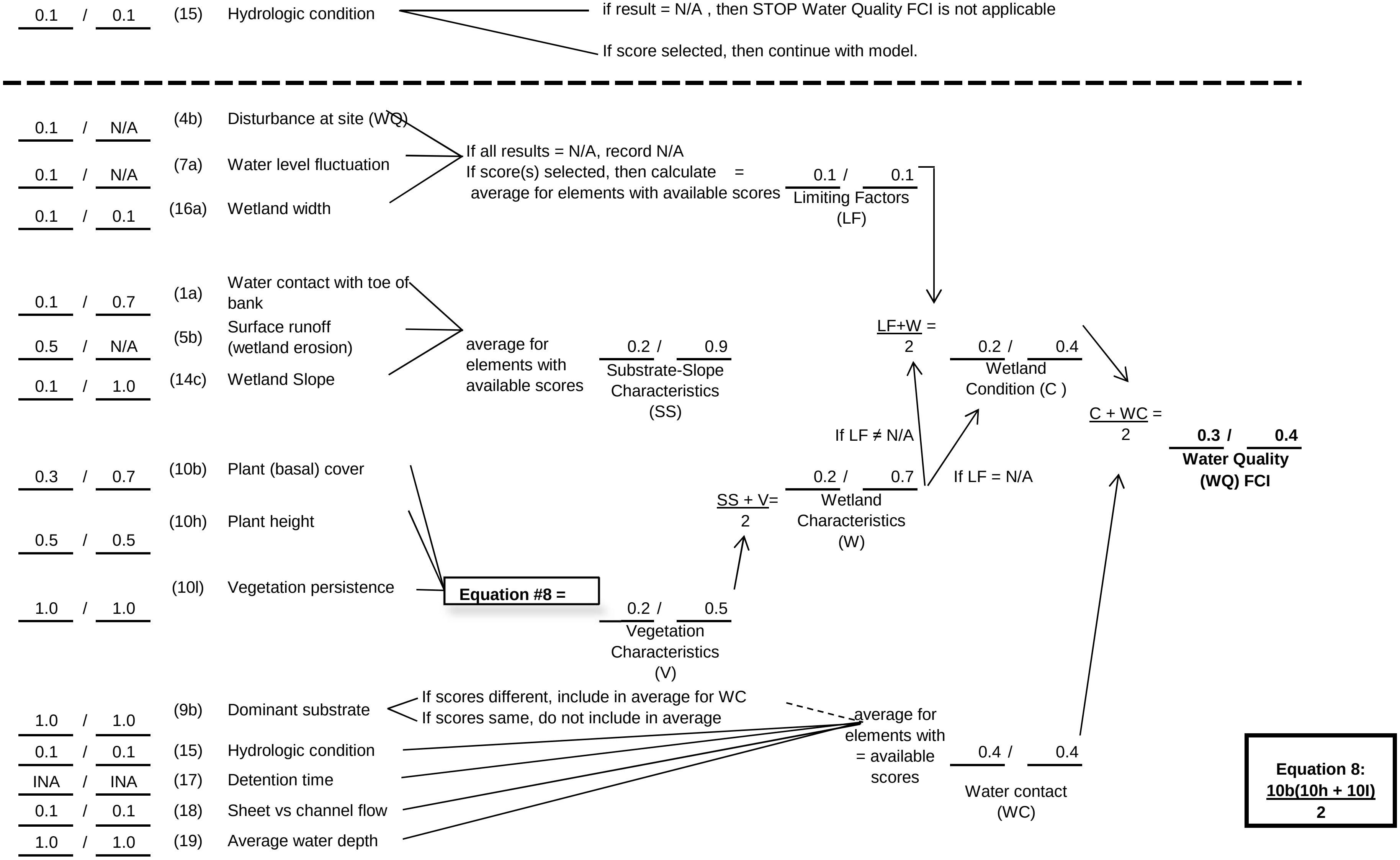
Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition
0.1 / N/A	(4b)	Disturbance at site (WQ)
0.1 / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width
0.1 / 0.7	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope
0.3 / 0.7	(10b)	Plant (basal) cover
0.5 / 0.5	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

Hydrologic condition (15):
if result = N/A , then STOP Water Quality FCI is not applicable
If score selected, then continue with model.

(4b), (7a), (16a):
If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

(1a), (5b), (14c): average for elements with available scores 0.2 / 0.9 Substrate-Slope Characteristics (SS)

(10b), (10h), (10l): **Equation #8 =** 0.2 / 0.5 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ =

If LF = N/A:

0.2 / 0.4 Wetland Condition (C)

(9b): If scores different, include in average for WC
If scores same, do not include in average

(9b), (15), (17), (18), (19): average for elements with = available scores 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ) FCI**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size
0.5	0.5	(11a)	Layers
0.1	0.7	(11b)	Condition of Layers
N/A	N/A	(11c)	Spatial pattern of shrubs/trees
0.1	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
0.1	0.1	(12d)	Undesirable species
0.5	0.5	(13a)	% open water
0.1	0.5	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.6 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores	(#)	Element	Comparison:________ / ________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A / N/A	(24)	Obstruction to fish passage	→ if result = 0.1, STOP. There is no potential for providing tidal fish habitat → if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores	(#)	Element		
0.1 / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.1 / N/A Limiting Factors
0.1 / N/A	(4a)	Disturbance at site (SS)		
N/A / N/A	(4d)	Disturbance in channel/open water		
N/A / N/A	(16c)	Fish habitat size		
N/A / N/A	(24)	Obstruction to fish passage		
0.5 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.4 Food/Cover
0.3 / 0.3	(10o)	Plant biomass		
0.5 / 0.5	(21b)	Shape of wetland/water edge		
0.3 / 0.3	(22b)	Available fish cover/attractors		
0.1 / 0.1	(25a)	% pool area		
0.1 / 0.5	(26)	Bank account		
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction
0.5 / 0.5	(27a)	Spawning substrate		
N/A / N/A	(27b)	Spawning structures		
0.5 / 0.5	(20b)	Water quality rating	→ If score available, record score for WQ → If information not available, continue	
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)
INA / INA	(20d)	Dissolved Oxygen		
INA / INA	(20e)	pH		
INA / INA	(20f)	Maximum water temperature		
INA / INA	(20g)	Turbidity		

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Uniqueness/Heritage

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**
Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~
Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~ = 0.1 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.3 / 0.9** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 2

Calculation of Wildlife Upland

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7
Vegetation Strata

Selected Scores	(#)	Element
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species

average for elements with available scores = 0.2 / 0.2
Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.3
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.2
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative B Year 2

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.40	1	0.0064	0.60	0.0106	0.71	0.22	0.157	Y
SS	0.16	0.02	0.003	0.30	1	0.0032	0.50	0.0064	0.86	0.22	0.189	Y
WQ	0.28	0.02	0.006	0.40	1	0.0056	0.40	0.0141	0.40	0.22	0.087	Y
WL	0.15	0.02	0.003	0.20	1	0.0030	0.20	0.0149	0.22	0.22	0.049	Y
FS	0.35	0.02	0.007	0.40	1	0.0070	0.40	0.0175	0.46	0.22	0.100	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

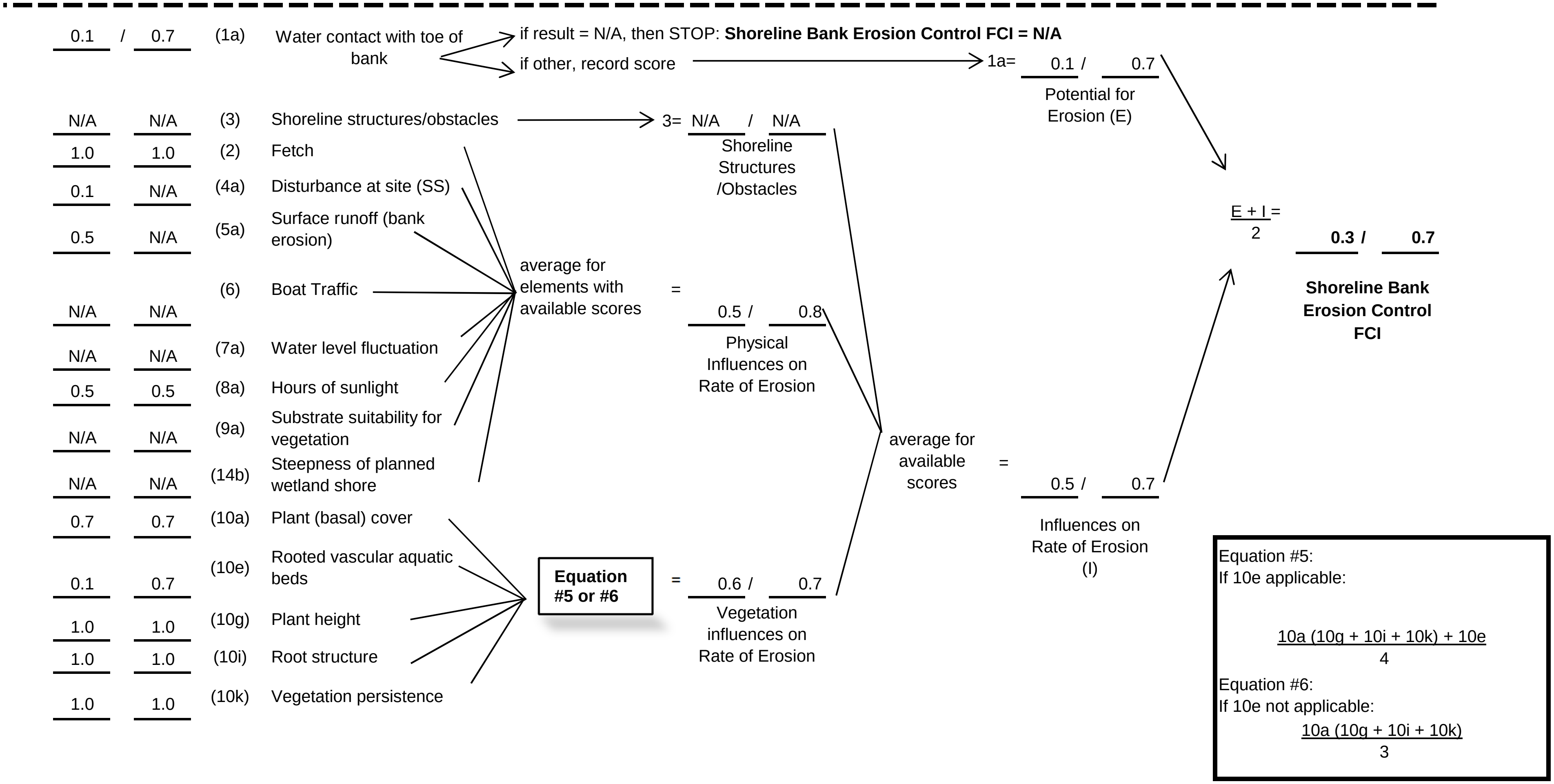
Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model



Selected Scores		(#)	Element
0.1 /	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.7 Potential for Erosion (E)

3= N/A / N/A Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8 Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.6 / 0.7 Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.3 /** **0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Sediment Stabilization

Comparison: ____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
0.1	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
1.0	1.0	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a = 0.1 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.2 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Water Quality

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.1 / N/A	(4b)	Disturbance at site (WQ)
0.1 / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.1 / 0.7	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope

average for elements with available scores = 0.2 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
0.5 / 0.5	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.2 / 0.5 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.2 / 0.4 Wetland Condition (C)

If LF = N/A: Wetland Condition (C) = Wetland Characteristics (W)

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

Dominant substrate: If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ) FCI**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Wildlife

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.6
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.2 / 0.3
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat
if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.1	N/A	(1b)	Shoreline bank stability
0.1	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.1 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.1	0.1	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.3 / 0.4 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ
If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison: ____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**
Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +} 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores			(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

0.1	/	N/A	(4a)	Disturbance at site
~~N/A~~	/	~~N/A~~	(7a)	Water level fluctuation
1.0	/	1.0	(10b)	Plant (basal) cover
0.1	/	0.3	(10c)	Leaf litter and debris cover
0.5	/	0.5	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
0.1	/	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.1 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.3 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 2

Calculation of Wildlife Upland

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative C Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.5	1	0.0064	0.5	0.01275	0.61	0.206	0.126	Y
SS	0.16	0.02	0.003	0.3	1	0.0032	0.3	0.010583	0.48	0.206	0.099	Y
WQ	0.28	0.02	0.006	0.4	1	0.0056	0.4	0.014115	0.33	0.206	0.068	Y
WL	0.15	0.02	0.003	0.2	1	0.003	0.2	0.014919	0.22	0.206	0.046	Y
FS	0.35	0.02	0.007	0.5	1	0.007	0.5	0.014	0.47	0.206	0.096	Y
UH	1.00			1					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.1 /	0.5	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.5

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.6 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.3 /** **0.6**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.5	(4a)	Disturbance at site
0.1	0.1	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
1.0	1.0	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.1 / 0.1 Disturbance Factors (DF)

Equation #7 = 0.3 / 0.7 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.5** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	/ 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.1	/ 0.5	(4b)	Disturbance at site (WQ)
0.1	/ 0.1	(7a)	Water level fluctuation
0.1	/ 0.1	(16a)	Wetland width

If all results = N/A, record N/A

If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
0.1	/ 0.5	(1a)	Water contact with toe of bank
0.5	/ N/A	(5b)	Surface runoff (wetland erosion)
0.1	/ 0.1	(14c)	Wetland Slope

average for elements with available scores 0.2 / 0.3 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	/ 0.7	(10b)	Plant (basal) cover
0.5	/ 0.5	(10h)	Plant height
1.0	/ 1.0	(10l)	Vegetation persistence

Equation #8 = 0.2 / 0.5 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.4 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.2 / 0.3 Wetland Condition (C)

If LF = N/A: Wetland Condition (C)

Selected Scores		(#)	Element
1.0	/ 1.0	(9b)	Dominant substrate
0.1	/ 0.1	(15)	Hydrologic condition
INA	/ INA	(17)	Detention time
0.1	/ 0.1	(18)	Sheet vs channel flow
1.0	/ 1.0	(19)	Average water depth

If scores different, include in average for WC

If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.3 Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size
0.5	0.5	(11a)	Layers
0.1	0.7	(11b)	Condition of Layers
N/A	N/A	(11c)	Spatial pattern of shrubs/trees
0.1	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
0.1	0.1	(12d)	Undesirable species
0.5	0.5	(13a)	% open water
0.1	0.5	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.6 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.2
Wildlife FCI

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores	(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(24)	Obstruction to fish passage

- if result = 0.1, STOP. There is no potential for providing tidal fish habitat
- if result ≠ 0.1 or N/A, then continue with model

Selected Scores	(#)	Element
0.1 / 0.5	(1b)	Shoreline bank stability
0.1 / N/A	(4a)	Disturbance at site (SS)
N/A / N/A	(4d)	Disturbance in channel/open water
N/A / N/A	(16c)	Fish habitat size
N/A / N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.1 / 0.5 Limiting Factors

Selected Scores	(#)	Element
0.5 / 0.5	(10m)	Vegetative overhang
0.3 / 0.3	(10o)	Plant biomass
0.5 / 0.5	(21b)	Shape of wetland/water edge
0.3 / 0.3	(22b)	Available fish cover/attractors
0.1 / 0.1	(25a)	% pool area
0.1 / 0.5	(26)	Bank account

average for elements with available scores = 0.3 / 0.4 Food/Cover

Selected Scores	(#)	Element
N/A / N/A	(25b)	Current velocity within pools
0.5 0.5	(27a)	Spawning substrate
N/A N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores	(#)	Element
0.5 / 0.5	(20b)	Water quality rating

- If score available, record score for WQ
- If information not available, continue

Selected Scores	(#)	Element
INA / INA	(20c)	Nutrient/sediment/contaminant sources
INA / INA	(20d)	Dissolved Oxygen
INA / INA	(20e)	pH
INA / INA	(20f)	Maximum water temperature
INA / INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**
Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~
Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
0.1	/	N/A	(4a)	Disturbance at site
~~N/A~~	/	~~N/A~~	(7a)	Water level fluctuation
1.0	/	1.0	(10b)	Plant (basal) cover
0.1	/	0.3	(10c)	Leaf litter and debris cover
0.5	/	0.5	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
0.1	/	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.3 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 2

Calculation of Wildlife Upland

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
0.1	/	N/A	(4c)	Disturbance of wildlife habitat
N/A	/	N/A	(20a)	Gross contamination
0.1	/	0.1	(16b)	Wetland size
0.7	/	0.7	(11a)	Layers
0.3	/	0.3	(11b)	Condition of Layers
1.0	/	1.0	(11c)	Spatial pattern of shrubs/trees
0.2	/	0.2	(12a)	Cover types
0.5	/	0.5	(12b)	Ratio of cover types
0.1	/	0.1	(12c)	Cover type interspersion
0.1	/	0.1	(12d)	Undesirable species
~~N/A~~	/	~~N/A~~	(13a)	% open water
~~N/A~~	/	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	/	0.1	(21a)	Shape of upland/wetland edge
N/A	/	N/A	(22a)	Wildlife attractors
~~N/A~~	/	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2
Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.3
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

`

Muskrat Cove

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.74	0.63	0.468	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.63	0.420	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.38	0.63	0.243	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.23	0.63	0.143	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.55	0.63	0.348	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Sediment Stabilization

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

N/A / N/A (4a) Disturbance at site
N/A / N/A (7a) Water level fluctuation

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

0.1 / 0.3 (10b) Plant (basal) cover
0.1 / 0.3 (10c) Leaf litter and debris cover
0.1 / 0.5 (10j) Root structure
0.1 / 1.0 (10l) Vegetation Persistence

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

1.0 / 1.0 (14c) Wetland slope

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.7**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Water Quality

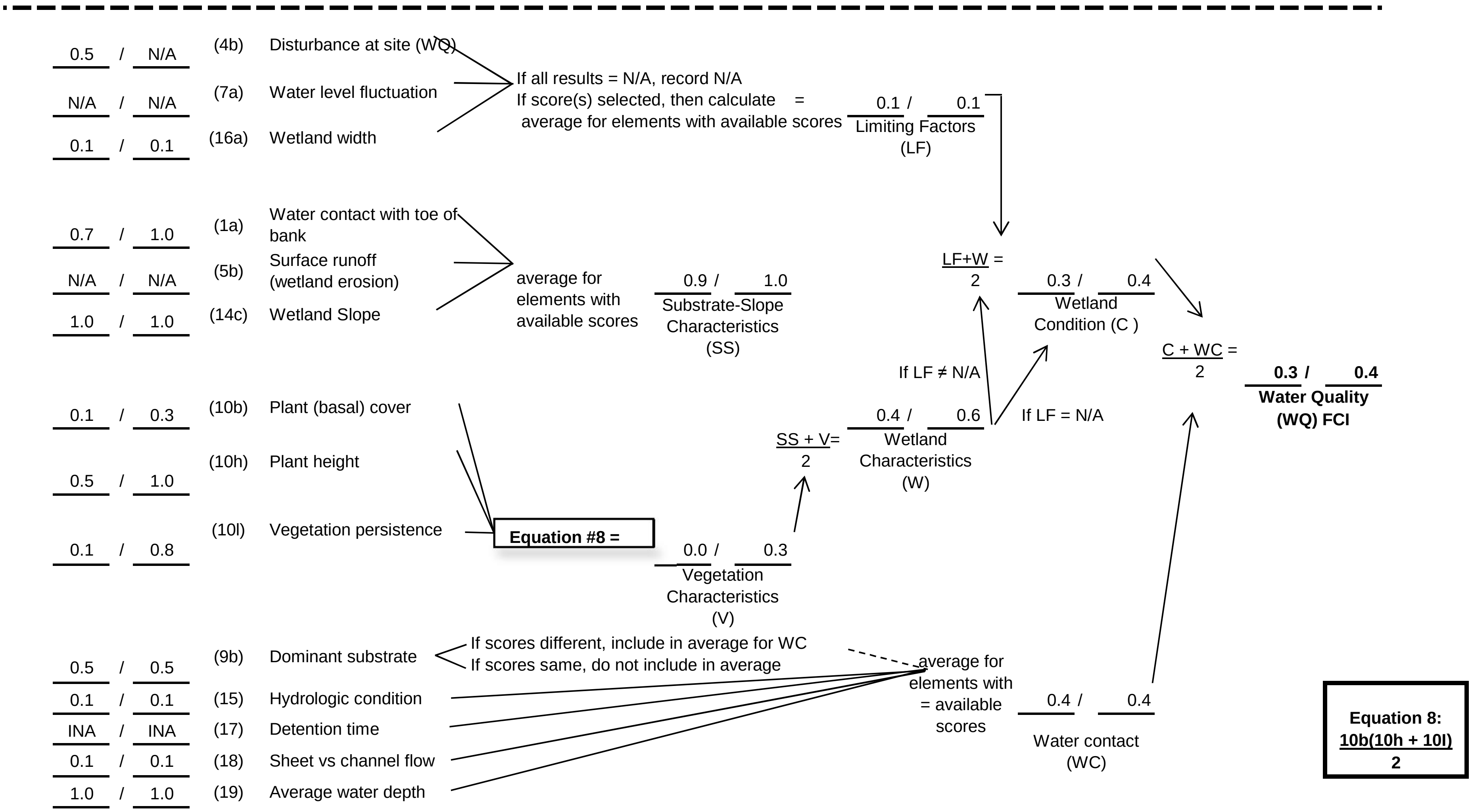
Selected Scores			(#)	Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



0.5 / N/A (4b) Disturbance at site (WQ)

N/A / N/A (7a) Water level fluctuation

0.1 / 0.1 (16a) Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

0.7 / 1.0 (1a) Water contact with toe of bank

N/A / N/A (5b) Surface runoff (wetland erosion)

1.0 / 1.0 (14c) Wetland Slope

average for elements with available scores 0.9 / 1.0 Substrate-Slope Characteristics (SS)

0.1 / 0.3 (10b) Plant (basal) cover

0.5 / 1.0 (10h) Plant height

0.1 / 0.8 (10l) Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

0.5 / 0.5 (9b) Dominant substrate

If scores different, include in average for WC
If scores same, do not include in average

0.1 / 0.1 (15) Hydrologic condition

INA / INA (17) Detention time

0.1 / 0.1 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Wildlife

Selected Scores	(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.3 / 0.7	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.0 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / 1.0	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.4
Physical Features

average for available scores = 0.1 / 0.4
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.1 / 0.2**

If F = NA

Wildlife FCI

`

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(24)	Obstruction to fish passage

→ if result = 0.1, STOP. There is no potential for providing tidal fish habitat

→ if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
0.5 /	0.5	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
N/A /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.1 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

→ If score available, record score for WQ

→ If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 /** **0.6**

Fish (Non-Tidal Stream/River) FCI

Project Title:Site 862. Muskrat Cove Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Upland Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

1.0	1.0	(10b)	Plant (basal) cover
0.3	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

1.0	1.0	(14c)	Wetland slope

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 2

Calculation of Wildlife (Upland)

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.3
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.74	0.63	0.468	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.63	0.420	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.46	0.63	0.290	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.19	0.63	0.120	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.55	0.63	0.348	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

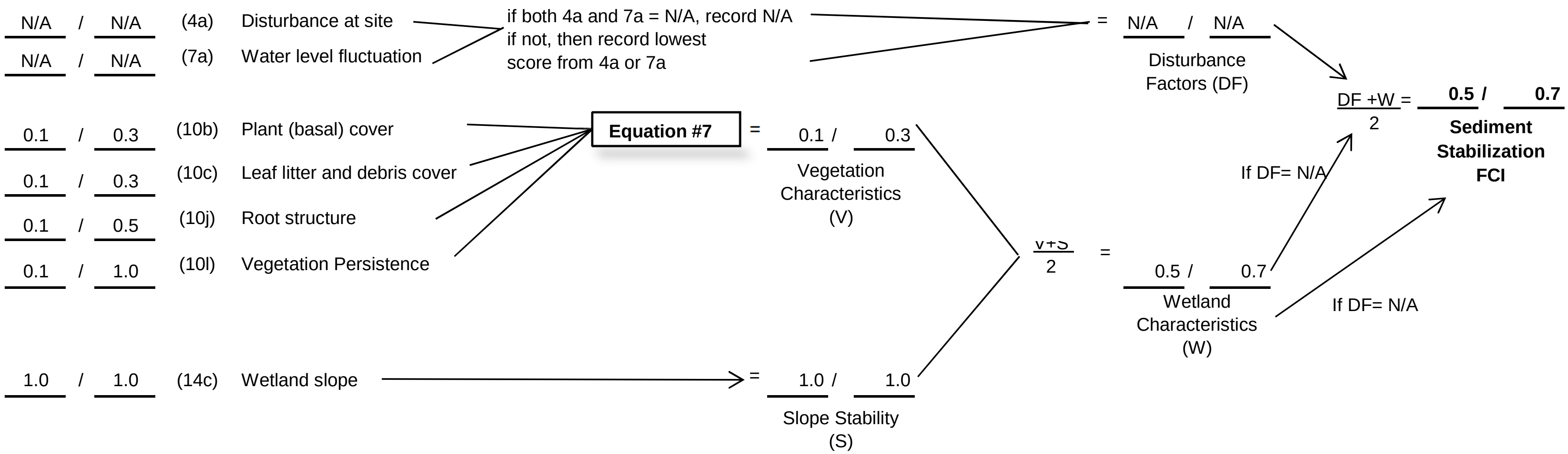
$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Sediment Stabilization

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



N/A / N/A	(4a)	Disturbance at site	
N/A / N/A	(7a)	Water level fluctuation	
0.1 / 0.3	(10b)	Plant (basal) cover	
0.1 / 0.3	(10c)	Leaf litter and debris cover	
0.1 / 0.5	(10j)	Root structure	
0.1 / 1.0	(10l)	Vegetation Persistence	
1.0 / 1.0	(14c)	Wetland slope	

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.7**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 0.9 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	1.0	(10h)	Plant height
0.1	0.8	(10l)	Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A: 0.3 / 0.4 Wetland Condition (C)

Selected Scores		(#)	Element
0.5	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

(9b) If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.5 Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Wildlife

Selected Scores	(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.3 / 0.7	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.0 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.1 / 0.3
Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ =

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores	(#)	Element	Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model	

N/A / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / 0.5 Limiting Factors
N/A / N/A	(4a)	Disturbance at site (SS)		
0.5 / 0.5	(4d)	Disturbance in channel/open water		
N/A / N/A	(16c)	Fish habitat size		
N/A / N/A	(24)	Obstruction to fish passage		
0.1 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.5 Food/Cover
0.1 / 0.3	(10o)	Plant biomass		
0.5 / 0.5	(21b)	Shape of wetland/water edge		
0.3 / 0.8	(22b)	Available fish cover/attractors		
0.5 / 0.5	(25a)	% pool area		
0.1 / 0.1	(26)	Bank account		
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.8 Reproduction
0.5 / 0.5	(27a)	Spawning substrate		
N/A / 1.0	(27b)	Spawning structures		
0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue	
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)
INA / INA	(20d)	Dissolved Oxygen		
INA / INA	(20e)	pH		
INA / INA	(20f)	Maximum water temperature		
INA / INA	(20g)	Turbidity		

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a) → [redacted] 1a= N/A / N/A

Potential for Erosion (E)

(3) → 3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b) → average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k) → **Equation #5 or #6** = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores	(#)	Element

Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.3	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 2

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.3 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.548	0.020	0.011	0.59	1	0.0110	0.59	0.0186	0.59	0.04	0.022	Y
SS	0.528	0.020	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.04	0.024	Y
WQ	0.335	0.020	0.007	0.38	1	0.0067	0.38	0.0176	0.37	0.04	0.013	Y
WL	0.110	0.020	0.002	0.15	1	0.0022	0.15	0.0147	0.19	0.04	0.007	Y
FS	0.442	0.020	0.009	0.45	1	0.0088	0.45	0.0196	0.45	0.04	0.017	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative CYear 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.6**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

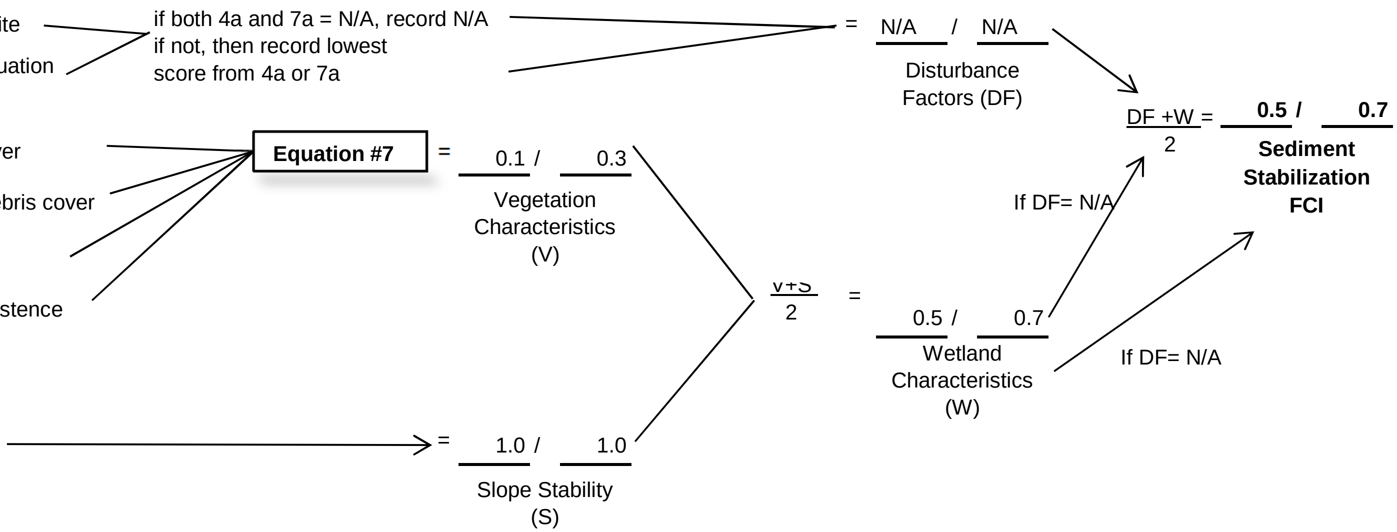
$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Calculation of Sediment Stabilization

Comparison:____________________________ / ____________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.3	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.1	0.5	(10j)	Root structure
0.1	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope



if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 0.9 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
0.1	1.0	(10l)	Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.3 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
0.5	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ) FCI**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.3 / 0.7	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.0 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.2 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.2
Wildlife FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element	Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

N/A	N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / 0.5 Limiting Factors
N/A	N/A	(4a)	Disturbance at site (SS)		
0.5	0.5	(4d)	Disturbance in channel/open water		
N/A	N/A	(16c)	Fish habitat size		
N/A	N/A	(24)	Obstruction to fish passage		
0.1	0.1	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.3 Food/Cover
0.1	0.3	(10o)	Plant biomass		
0.5	0.5	(21b)	Shape of wetland/water edge		
0.3	0.3	(22b)	Available fish cover/attractors		
0.5	0.5	(25a)	% pool area		
0.1	0.1	(26)	Bank account		
N/A	N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction
0.5	0.5	(27a)	Spawning substrate		
N/A	N/A	(27b)	Spawning structures		
0.5	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue	
INA	INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)
INA	INA	(20d)	Dissolved Oxygen		
INA	INA	(20e)	pH		
INA	INA	(20f)	Maximum water temperature		
INA	INA	(20g)	Turbidity		

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
~~If 10e not applicable:~~

$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$

Project Title: Site 862. Muskrat Cove Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:__________________________________ / __________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.3	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.9 / 0.9** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title:Site 862. Muskrat Cove Alternative C Year 2

Calculation of Wildlife (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.3 / 0.3
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

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Bronxville Lake

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative A Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.92	4.92	4.511	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.82	4.92	4.012	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.84	4.92	4.123	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.41	4.92	2.024	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.53	4.92	2.626	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

- -

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.7 / 1.0

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.1 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title:Site 851. Bronxville Alternative A Year 2

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
			Comparison:_________________________________ / _________________________________ (e.g., WAA/planned wetland)
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.6
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative A Year 2

Calculation of Water Quality

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores: 0.7 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.9 Wetland Condition (C)

If LF = N/A: Wetland Condition (C) = Wetland Characteristics (W)

Selected Scores		(#)	Element
0.5	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

Dominant substrate (9b): If scores different, include in average for WC; If scores same, do not include in average

average for elements with available scores = 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.5 / 0.8 Water Quality (WQ)**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 851. Bronxville Alternative A Year 2

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.3 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.3 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.4 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4 Wildlife FCI

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Project Title: Site 851. Bronxville Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

0.5 / N/A	(1b)	Shoreline bank stability	
0.5 / N/A	(4a)	Disturbance at site (SS)	average for elements with available scores = 0.4 / N/A Limiting Factors
N/A / N/A	(4d)	Disturbance in channel/open water	
0.1 / N/A	(16c)	Fish habitat size	
0.5 / N/A	(24)	Obstruction to fish passage	

0.5 / 1.0	(10m)	Vegetative overhang	
0.3 / 0.7	(10o)	Plant biomass	average for elements with available scores = 0.3 / 0.6 Food/Cover
0.5 / 0.5	(21b)	Shape of wetland/water edge	
0.3 / 0.8	(22b)	Available fish cover/attractors	
0.1 / 0.5	(25a)	% pool area	
0.1 / 0.1	(26)	Bank account	

N/A / N/A	(25b)	Current velocity within pools	
0.5 0.5	(27a)	Spawning substrate	average for elements with available scores = 0.5 / 0.5 Reproduction
N/A N/A	(27b)	Spawning structures	

0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

0.1 / 0.5	(20c)	Nutrient/sediment/contaminant sources	
INA / INA	(20d)	Dissolved Oxygen	average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)
INA / INA	(20e)	pH	
INA / INA	(20f)	Maximum water temperature	
INA / INA	(20g)	Turbidity	

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title:Site 851. Bronxville Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative A Year 2

Calculation of Upland Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 851. Bronxville Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison:			________________ / ________________ (e.g., WAA/planned wetland)
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ ~~/~~	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 /** **1.0**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative B Year 2

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.90	3.57	3.225	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.82	3.57	2.935	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.80	3.57	2.855	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.41	3.57	1.456	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.43	3.57	1.517	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.7 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.1 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative B Year 2

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.6 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.8**

Sediment Stabilization FCI

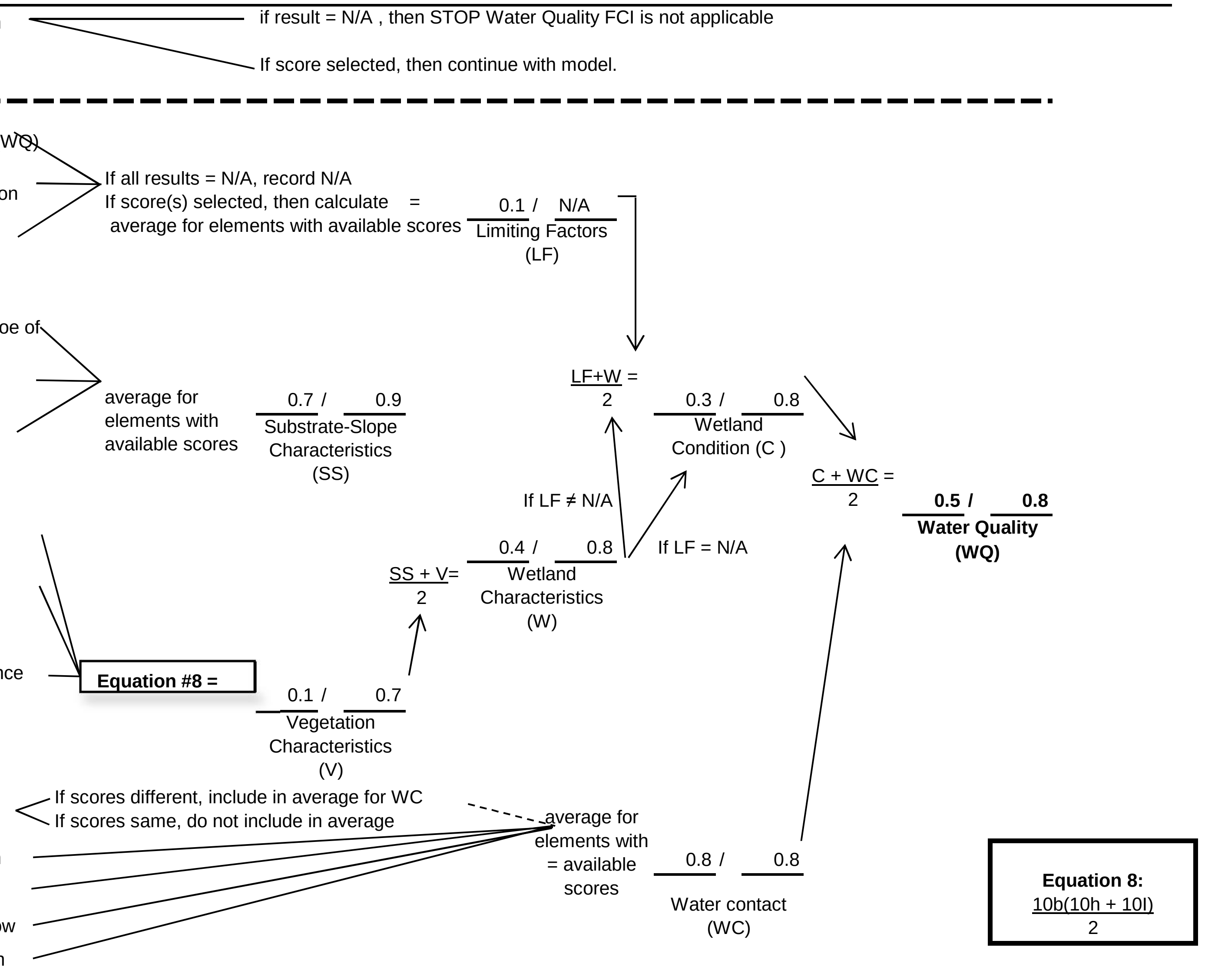
Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)



Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width
0.7	0.7	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.1	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
0.5	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

(15) Hydrologic condition: if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

(4b), (7a), (16a): If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

(1a), (5b), (14c): average for elements with available scores 0.7 / 0.9 Substrate-Slope Characteristics (SS)

(10b), (10h), (10l): **Equation #8 =** 0.1 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.8 Wetland Condition (C)

If LF = N/A: Wetland Condition (C) = W

(9b) Dominant substrate: If scores different, include in average for WC
If scores same, do not include in average

(9b), (15), (17), (18), (19): average for elements with available scores = 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.5 / 0.8 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title:Site 851. Bronxville Alternative B Year 2

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	N/A	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees
0.2	0.3	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
0.5	0.5	(13a)	% open water
0.1	0.1	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.3 / 0.4
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.3
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.4 / 0.4
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Project Title:Site 851. Bronxville Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
0.1 /	0.1	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / 0.1 Limiting Factors

Selected Scores		(#)	Element
0.5 /	1.0	(10m)	Vegetative overhang
0.3 /	0.7	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.1 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison: ____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative B Year 2

Calculation of Upland Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 851. Bronxville Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.9 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 1.0**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 2

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative C Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.75	1.01	0.755	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.58	1.01	0.580	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.60	1.01	0.603	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.37	1.01	0.371	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.59	1.01	0.598	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
0.5	0.5	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.7 / 0.7

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.1 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / 0.5 Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 /** **0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.3 / 0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

- -

Selected Scores	(#)	Element
0.5 / 0.5	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.7 / 1.0	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.7 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.1 / 0.3	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A: 0.3 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
0.5 / 1.0	(9b)	Dominant substrate
0.3 / 0.3	(15)	Hydrologic condition
INA / INA	(17)	Detention time
1.0 / 1.0	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.5 / 0.6 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element		
N/A	N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / N/A Features Which Reduce Habitat Value (F)
N/A	N/A	(20a)	Gross contamination		
0.1	N/A	(16b)	Wetland size		
0.7	0.7	(11a)	Layers	average for elements with available scores	= 0.8 / 0.8 Vegetation Strata
0.7	0.7	(11b)	Condition of Layers		
1.0	1.0	(11c)	Spatial pattern of shrubs/trees		
0.2	0.2	(12a)	Cover types	average for elements with available scores	= 0.3 / 0.3 Vegetation Cover Types
0.5	0.5	(12b)	Ratio of cover types		
0.1	0.1	(12c)	Cover type interspersion		
N/A	N/A	(12d)	Undesirable species		
0.5	0.5	(13a)	% open water	average for elements with available scores	= 0.3 / 0.3 Vegetation/ Water Proportions
0.1	0.1	(13b)	Vegetation/water interspersion		
0.1	0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.1 / 0.1 Physical Features
N/A	N/A	(22a)	Wildlife attractors		
0.1	0.1	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.4 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.4 Wildlife FCI**

If F = NA: **0.2 / 0.4 Wildlife FCI**

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

→ if result = 0.1, STOP. There is no potential for providing tidal fish habitat

→ if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
0.1 /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5 /	0.5	(10m)	Vegetative overhang
0.3 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.1 /	1.0	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

→ If score available, record score for WQ

→ If information not available, continue

Selected Scores		(#)	Element
0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

Limiting Factors, Food/Cover, Reproduction, Water Quality: average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
			Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 1.0**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative C Year 2

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

Crestwood Lake

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.95	6.28	5.966	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.87	6.28	5.448	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.81	6.28	5.076	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.60	6.28	3.799	Y
FS	0.36	2.00	0.717	0.37	1	0.7167	0.37	1.9369	0.67	6.28	4.222	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

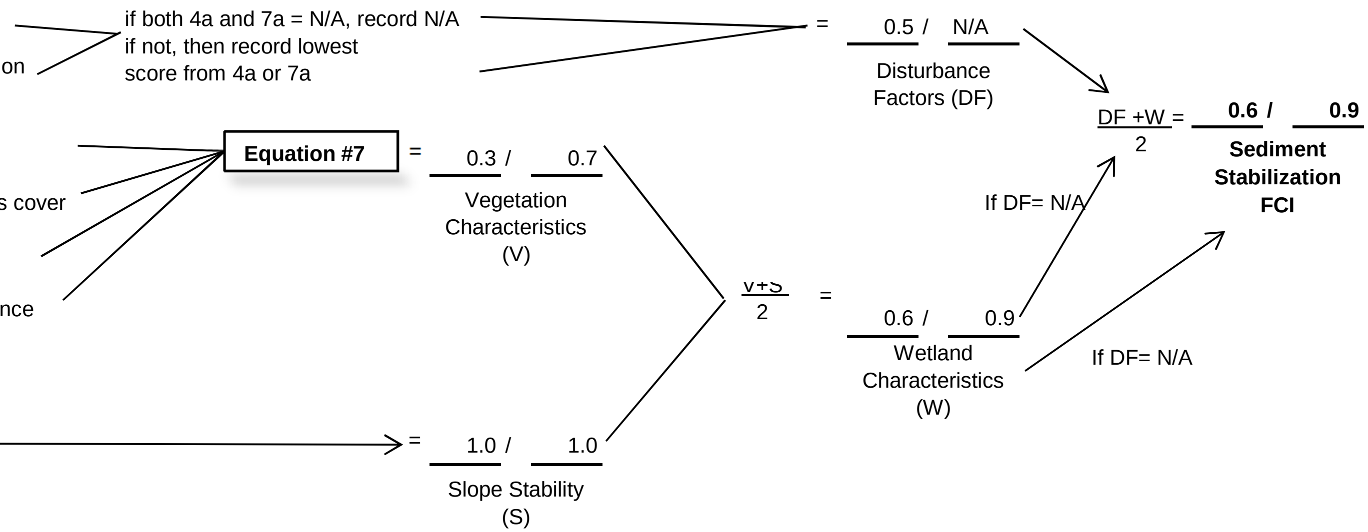
$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
0.5	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.7	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

Comparison:________________ / ________________ (e.g., WAA/planned wetland)



Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element	
0.3 / 0.3	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.

Selected Scores	(#)	Element
0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

Selected Scores	(#)	Element
1.0 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.7 Vegetation Characteristics (V)

SS + V= / 2 → 0.7 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 → 0.4 / 0.9 Wetland Condition (C)

If LF = N/A → Wetland Condition (C)

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.3 / 0.3	(15)	Hydrologic condition
INA / INA	(17)	Detention time
1.0 / 1.0	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

(9b): If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

C + WC = / 2 → **0.6 / 0.8** **Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Wildlife

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.5 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
1.0 / 1.0	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.5 / 0.5
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.7 / 0.7
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.6**

If F = NA: **0.3 / 0.6**

Wildlife FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A	N/A	(1b)	Shoreline bank stability
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.1	0.5	(25a)	% pool area
0.1	1.0	(26)	Bank account

average for elements with available scores = 0.2 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.2	1.0	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 1.0 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.7**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a) → [redacted] 1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

(3) → 3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b) → average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k) → **Equation #5 or #6** = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.7	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / 0.0 Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / 0.4**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 2

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.9 / 0.9
Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.5 / 0.5
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.95	2.44	2.317	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.82	2.44	1.987	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.62	2.44	1.514	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.35	2.44	0.848	Y
FS	0.36	2.00	0.717	0.37	1	0.7167	0.37	1.9369	0.38	2.44	0.935	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A
Shoreline Structures /Obstacles

(2)–(14b): average for elements with available scores = 0.8 / 1.0
Physical Influences on Rate of Erosion

(10a)–(10k): **Equation #5 or #6** = 0.7 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9
Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.7	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A if not, then record lowest score from 4a or 7a = 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.6 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

$\frac{DF + W}{2}$ = **0.6 / 0.8** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

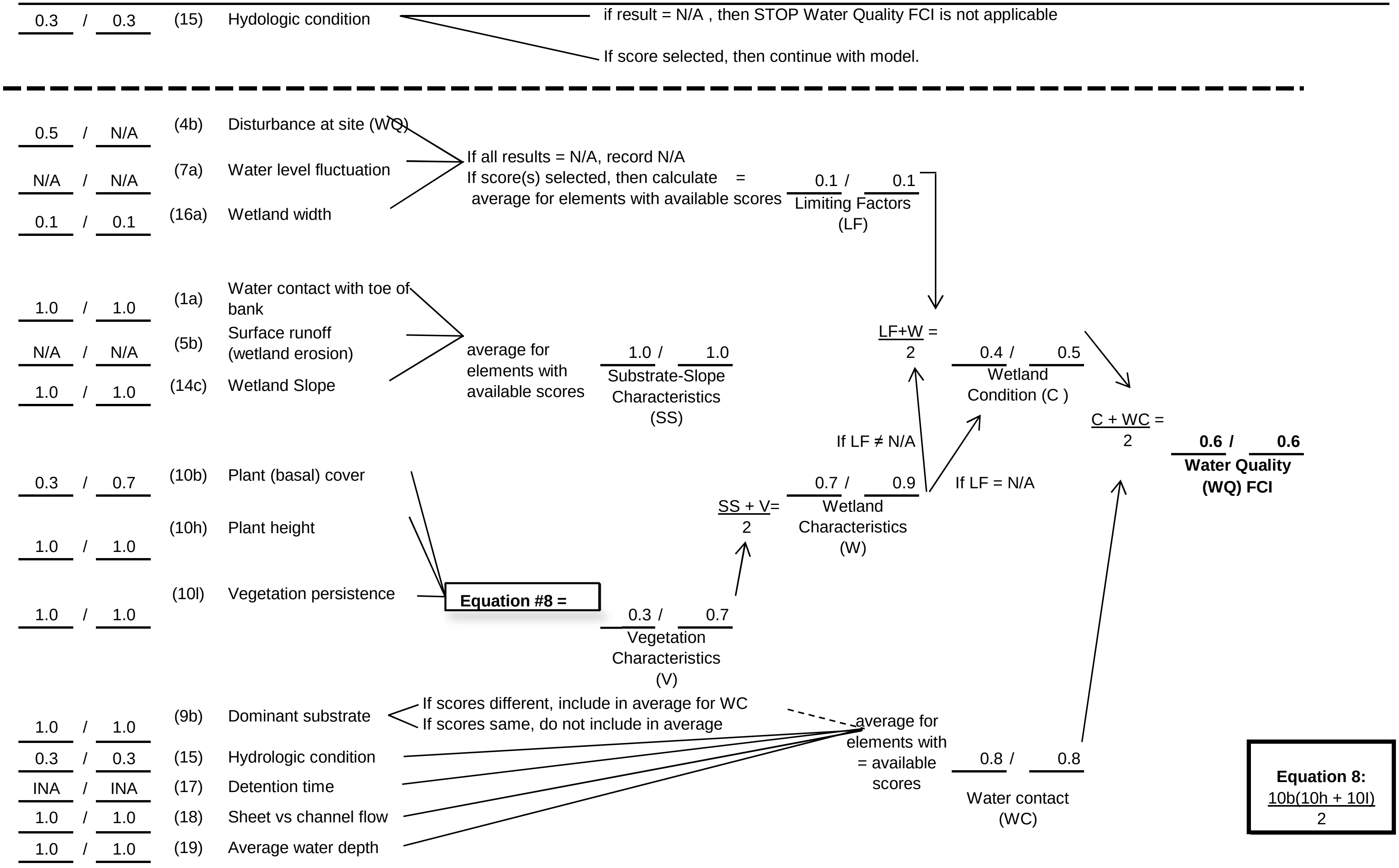
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title:Site 852. Crestwood Lake Alternative B Year 2

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



Selected Scores		(#)	Element
0.3	/ 0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	/ N/A	(4b)	Disturbance at site (WQ)
N/A	/ N/A	(7a)	Water level fluctuation
0.1	/ 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	/ 1.0	(1a)	Water contact with toe of bank
N/A	/ N/A	(5b)	Surface runoff (wetland erosion)
1.0	/ 1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	/ 0.7	(10b)	Plant (basal) cover
1.0	/ 1.0	(10h)	Plant height
1.0	/ 1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.7 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.5 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
1.0	/ 1.0	(9b)	Dominant substrate
0.3	/ 0.3	(15)	Hydrologic condition
INA	/ INA	(17)	Detention time
1.0	/ 1.0	(18)	Sheet vs channel flow
1.0	/ 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.6 / 0.6 Water Quality (WQ) FCI**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title:Site 852. Crestwood Lake Alternative B Year 2

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element		
N/A / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / 0.1 Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination		
0.1 / 0.1	(16b)	Wetland size		
0.7 / 0.7	(11a)	Layers	average for elements with available scores	= 0.8 / 0.8 Vegetation Strata
0.7 / 0.7	(11b)	Condition of Layers		
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees		
0.1 / 0.1	(12a)	Cover types	average for elements with available scores	= 0.4 / 0.4 Vegetation Cover Types
0.5 / 0.5	(12b)	Ratio of cover types		
0.5 / 0.5	(12c)	Cover type interspersion		
N/A / N/A	(12d)	Undesirable species		
0.5 / 0.5	(13a)	% open water	average for elements with available scores	= 0.5 / 0.5 Vegetation/ Water Proportions
0.5 / 0.5	(13b)	Vegetation/water interspersion		
0.1 / 0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.7 / 0.7 Physical Features
1.0 / 1.0	(22a)	Wildlife attractors		
1.0 / 1.0	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3**

If F = NA: **Wildlife FCI**

0.3 / 0.3

Wildlife FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.3 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.3	(22b)	Available fish cover/attractors
0.1 /	0.1	(25a)	% pool area
0.1 /	1.0	(26)	Bank account

average for elements with available scores = 0.2 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.2	0.2	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.2 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison:	/		(e.g., WAA/planned wetland)
0.5	0.5	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / 0.5
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.7**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 2

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.7	0.7	(11a)	Layers
1.0	1.0	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.9 / 0.9 Vegetation Strata

Selected Scores		(#)	Element
0.2	0.2	(12a)	Cover types
1.0	1.0	(12b)	Ratio of cover types
0.1	0.1	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.5 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.96	1.79	1.715	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.67	1.79	1.193	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.57	1.79	1.024	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.35	1.79	0.627	Y
FS	0.36	2.00	0.717	0.40	1	0.7167	0.40	1.7917	0.49	1.79	0.877	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title:Site 852. Crestwood Lake Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Shoreline structures/obstacles → 3= N/A / N/A

Shoreline Structures /Obstacles

(2) through (14b): average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

(10a) through (10k): **Equation #5 or #6** = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

E + I / 2 = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.3	0.3	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.3 / 0.3 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Calculation of Water Quality

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
1.0	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.6 / 0.6 Water Quality (WQ) FCI**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.5 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
1.0 / 1.0	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.5 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.7 / 0.7 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Project Title:Site 852. Crestwood Lake Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores	(#)	Element	Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5	/	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

N/A	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
N/A	/	N/A	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
0.5	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

0.1	/	0.5	(10m)	Vegetative overhang
0.3	/	0.3	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.3	(22b)	Available fish cover/attractors
0.1	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.2 / 0.4 Food/Cover

N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.2	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.6 Reproduction

0.5	/	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Calculation of Upland Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**
Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~
Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

4a, 7a: if both 4a ~~and 7a~~ = N/A, record N/A if not, then record ~~lowest~~ score from 4a ~~or 7a~~ = 0.5 / 0.5 Disturbance Factors (DF)

10b, 10c, 10j, 10l: **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

14c: = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.7 / 0.7 Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 2

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.9 / 0.9 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.5 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3 Wildlife FCI**

If F = NA: **0.3 / 0.3 Wildlife FCI**

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Harney Road & Garth Woods

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Comparison between WAA#____________________ and wetland # ____________________

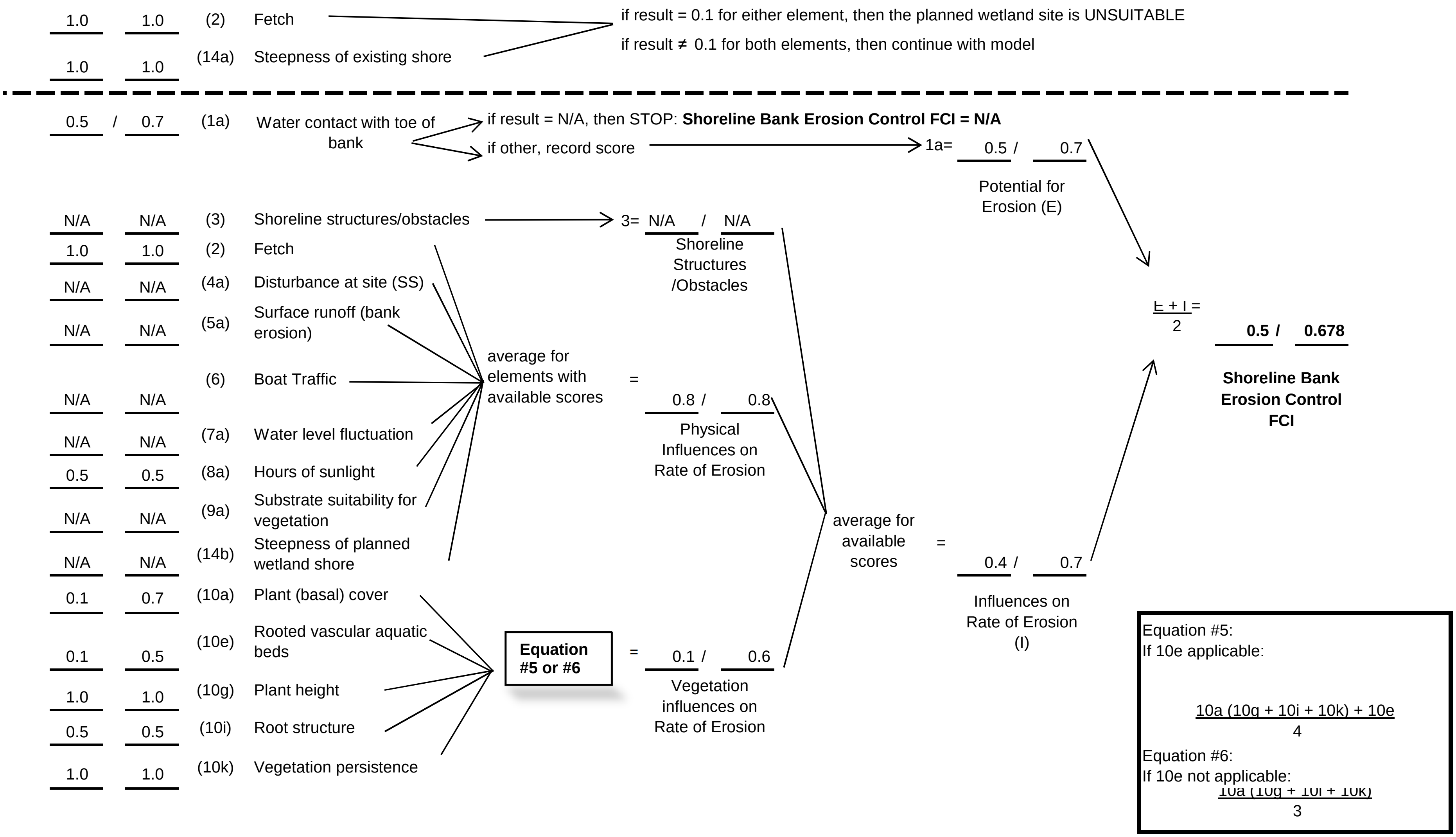
Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.46	0.20	0.092	0.60	1	0.0919	0.60	0.1531	0.68	0.34	0.230	Y
SS	0.10	0.20	0.020	0.15	1	0.0200	0.15	0.1333	0.18	0.34	0.061	Y
WQ	0.44	0.20	0.088	0.55	1	0.0877	0.55	0.1595	0.59	0.34	0.201	Y
WL	0.23	0.20	0.046	0.40	1	0.0458	0.40	0.1145	0.40	0.34	0.135	Y
FS	0.39	0.20	0.078	0.39	1	0.0775	0.39	0.1987	0.39	0.34	0.131	Y
UH	1.00			1.00					1.00			Y

*FCUs	=	FCU x AREA
**Target FCI	=	*goal* established by decision makers
R	=	multiplying factor established by decision makers
Target FCUs	=	FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI	=	FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area	=	Target FCUs/Predicted FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)



Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.1 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.7

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.678**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Sediment Stabilization

Selected Scores | (#) | Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.3	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.1	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	0.1	(14c)	Wetland slope

4a, 7a: if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

10b, 10c, 10j, 10l: **Equation #7** = 0.1 / 0.3
Vegetation Characteristics (V)

14c: = 0.1 / 0.1
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.2
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.2**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores			(#)	Element
0.5	/	0.5	(4b)	Disturbance at site (WQ)
N/A	/	N/A	(7a)	Water level fluctuation
N/A	/	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.5 / 0.5 Limiting Factors (LF)

Selected Scores			(#)	Element
0.5	/	0.7	(1a)	Water contact with toe of bank
N/A	/	N/A	(5b)	Surface runoff (wetland erosion)
0.1	/	1.0	(14c)	Wetland Slope

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores			(#)	Element
0.1	/	0.3	(10b)	Plant (basal) cover
0.5	/	1.0	(10h)	Plant height
1.0	/	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.5 Wetland Condition (C)

If LF = N/A: Wetland Condition (C)

Selected Scores			(#)	Element
0.1	/	1.0	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.5	/	0.5	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

Dominant substrate: If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.5 / 0.7 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.6**
Water Quality (WQ) FCI

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.5 / 0.7	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = N/A / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.5 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.3 Vegetation/Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.4 / 0.4 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 / 0.5	(24)	Obstruction to fish passage	

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5	0.5	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
0.5	0.5	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1	0.1	(10m)	Vegetative overhang
0.1	0.1	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.8	0.8	(22b)	Available fish cover/attractors
0.5	0.5	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.4 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.2	0.2	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.2 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	/ N/A	(29)	Endangered species
N/A	/ N/A	(30)	Rarity
N/A	/ N/A	(31)	Unique features
N/A	/ N/A	(32)	Historical or archaeological significance
N/A	/ N/A	(33)	Natural landmark
N/A	/ N/A	(34)	Connected to Wild and Scenic River
1.0	/ 1.0	(35)	Park, sanctuary, etc.
N/A	/ N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
			Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores			(#)	Element
Comparison:				/ ____ (e.g., WAA/planned wetland)
N/A	/	N/A	(4a)	Disturbance at site
~~N/A~~	/	~~N/A~~	(7a)	Water level fluctuation
0.3	/	0.3	(10b)	Plant (basal) cover
0.7	/	0.7	(10c)	Leaf litter and debris cover
0.5	/	0.5	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
1.0	/	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.5 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.7**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 2

Calculation of Wildlife (Upland)

Selected Scores	(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.6
Physical Features

average for available scores = 0.6 / 0.6
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.6 / 0.6
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative A Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.94	1.62	1.511	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.76	1.62	1.224	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.69	1.62	1.111	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.39	1.62	0.622	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.66	1.62	1.059	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.1	1.0	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.3	(10b)	Plant (basal) cover
0.1 / 0.7	(10c)	Leaf litter and debris cover
0.5 / 0.8	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
0.1 / 1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A; if not, then record lowest score from 4a or 7a = N/A / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.5 Vegetation Characteristics (V)

(14c) = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.8 Wetland Characteristics (W)

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.8** **Sediment Stabilization FCI**

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Water Quality

Selected Scores			(#)	Element
				Comparison:__________________ / __________________ (e.g., WAA/planned wetland)
0.1	/	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores			(#)	Element
0.5	/	N/A	(4b)	Disturbance at site (WQ)
N/A	/	N/A	(7a)	Water level fluctuation
0.1	/	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate =
average for elements with available scores

0.1 / N/A
Limiting Factors (LF)

Selected Scores			(#)	Element
0.5	/	0.7	(1a)	Water contact with toe of bank
N/A	/	N/A	(5b)	Surface runoff (wetland erosion)
0.1	/	1.0	(14c)	Wetland Slope

average for elements with available scores

0.3 / 0.9
Substrate-Slope Characteristics (SS)

Selected Scores			(#)	Element
0.1	/	0.7	(10b)	Plant (basal) cover
1.0	/	1.0	(10h)	Plant height
1.0	/	1.0	(10l)	Vegetation persistence

Equation #8 =

0.1 / 0.7
Vegetation Characteristics (V)

$\frac{SS + V}{2}$=

0.2 / 0.8
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.2 / 0.8
Wetland Condition (C)

Selected Scores			(#)	Element
1.0	/	1.0	(9b)	Dominant substrate
0.1	/	0.3	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.5	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.6
Water contact (WC)

$\frac{C + WC}{2}$ =

0.3 / 0.7
Water Quality (WQ) FCI

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5	N/A	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.1	3.0	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.1	0.3	(22b)	Available fish cover/attractors
0.5	1.0	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.0 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	#N/A	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.7**

Fish (Non-Tidal Stream/River) FCI

Project Title:Site 853. Harney Road Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted] 1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / ~~#####~~

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2} =$ ~~N/A~~ **/** ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +} 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
0.5	/	N/A	(4a)	Disturbance at site
~~N/A~~	/	~~N/A~~	(7a)	Water level fluctuation
1.0	/	1.0	(10b)	Plant (basal) cover
0.1	/	0.3	(10c)	Leaf litter and debris cover
0.5	/	0.8	(10j)	Root structure
1.0	/	#N/A	(10l)	Vegetation Persistence
1.0	/	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / #N/A
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / #N/A**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 2

Calculation of Wildlife (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element	
0.1 / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination	
N/A / N/A	(16b)	Wetland size	
0.7 / 0.7	(11a)	Layers	average for elements with available scores = 0.7 / 0.8 Vegetation Strata
0.3 / 0.7	(11b)	Condition of Layers	
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees	
0.1 / 0.1	(12a)	Cover types	average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types
0.1 / 0.1	(12b)	Ratio of cover types	
0.5 / 0.5	(12c)	Cover type interspersion	
N/A / N/A	(12d)	Undesirable species	
~~N/A~~ / ~~N/A~~	(13a)	% open water	average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion	
0.1 / 0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores = 0.1 / 0.1 Physical Features
N/A / N/A	(22a)	Wildlife attractors	
~~N/A~~ / ~~N/A~~	(23)	Islands	

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative B Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.75	1.02	0.766	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.87	1.02	0.882	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.55	1.02	0.563	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.39	1.02	0.392	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.85	1.02	0.864	Y
UH	1.0			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2} =$ **0.6 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
Comparison:________________ / ________________ (e.g., WAA/planned wetland)			
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.7	(10b)	Plant (basal) cover
0.1	0.7	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.7
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.1 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores =

0.1 / N/A
Limiting Factors (LF)

Selected Scores		(#)	Element
0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope

average for elements with available scores

0.3 / 0.9
Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 =

0.1 / 0.3
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.2 / 0.6
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.2 / 0.6
Wetland Condition (C)

Selected Scores		(#)	Element
1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.5	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.5
Water contact (WC)

$\frac{C + WC}{2}$ =

0.3 / 0.6
Water Quality (WQ) FCI

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5	N/A	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.1	3.0	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.1	0.8	(22b)	Available fish cover/attractors
0.5	1.0	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.1 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	1.0	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 1.0 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.9**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
			Comparison:____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / ~~#####~~

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ **/** ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

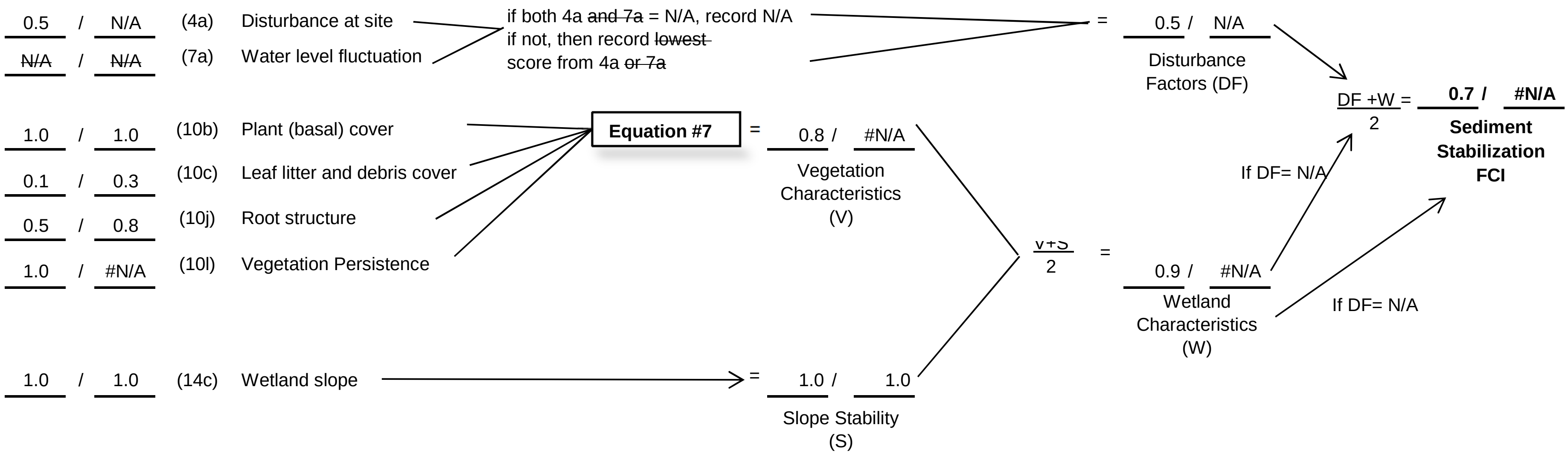
$$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)



0.5	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	#N/A	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / #N/A
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / #N/A**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 2

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative C Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.75	1.02	0.766	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.69	1.02	0.698	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.54	1.02	0.544	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.30	1.02	0.307	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.66	1.02	0.666	Y
UH	1.0			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

0.3	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.3	(10b)	Plant (basal) cover
0.1 / 0.3	(10c)	Leaf litter and debris cover
0.5 / 0.8	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
0.1 / 1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.4
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.1 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Water Quality

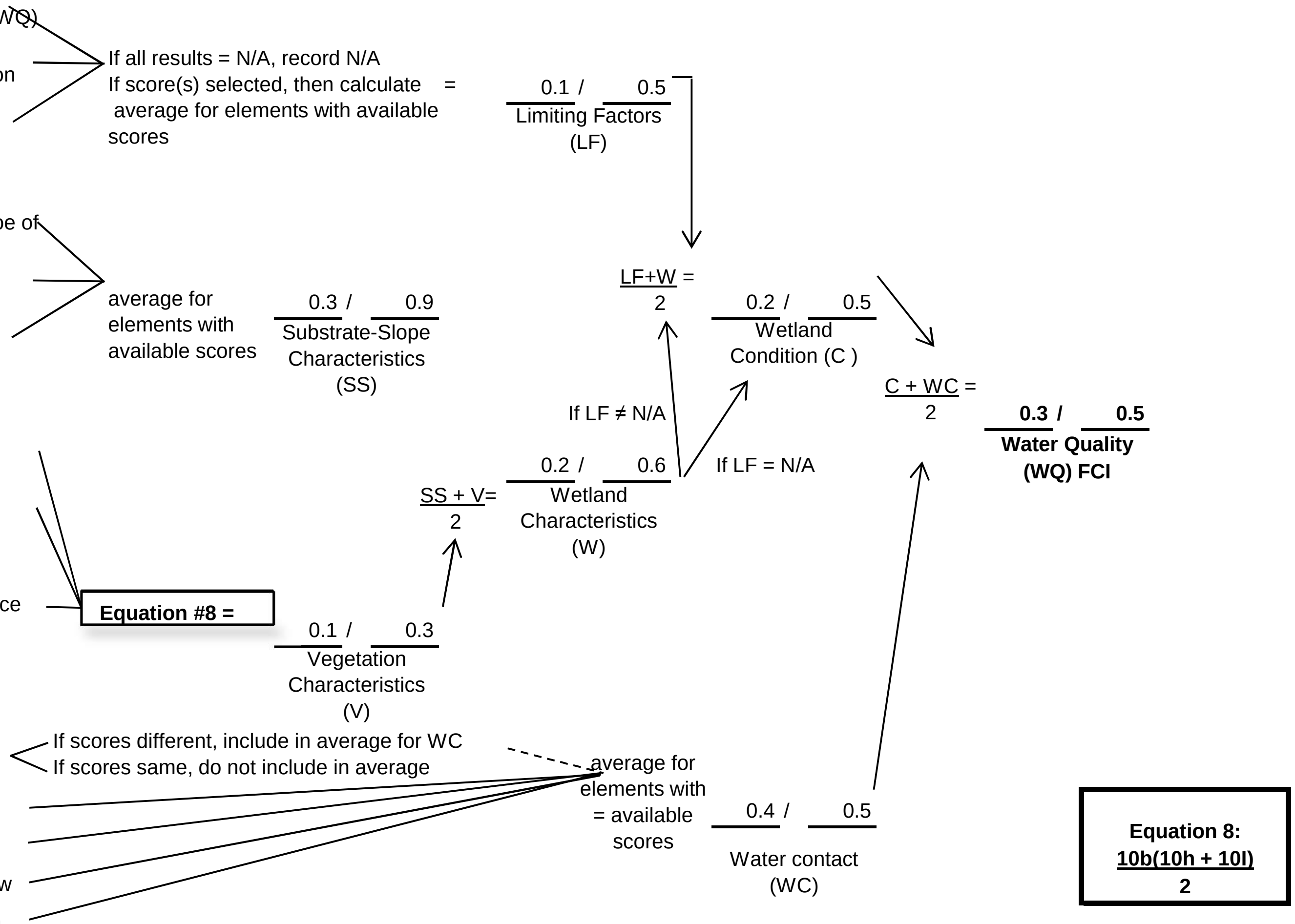
Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	0.5	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width
0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope
0.1	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.5	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth



If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores =

0.1 / 0.5
Limiting Factors (LF)

average for elements with available scores

0.3 / 0.9
Substrate-Slope Characteristics (SS)

Equation #8 =

0.1 / 0.3
Vegetation Characteristics (V)

$\frac{SS + V}{2} =$

0.2 / 0.6
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2} =$

If LF = N/A

0.2 / 0.5
Wetland Condition (C)

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.5
Water contact (WC)

$\frac{C + WC}{2} =$

0.3 / 0.5
Water Quality (WQ) FCI

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.3 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.3
Wildlife FCI

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
0.5 /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.1 /	3.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.1 /	0.3	(22b)	Available fish cover/attractors
0.5 /	1.0	(25a)	% pool area
0.1 /	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.0 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 /** **0.7**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / ~~#####~~

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ **/** ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

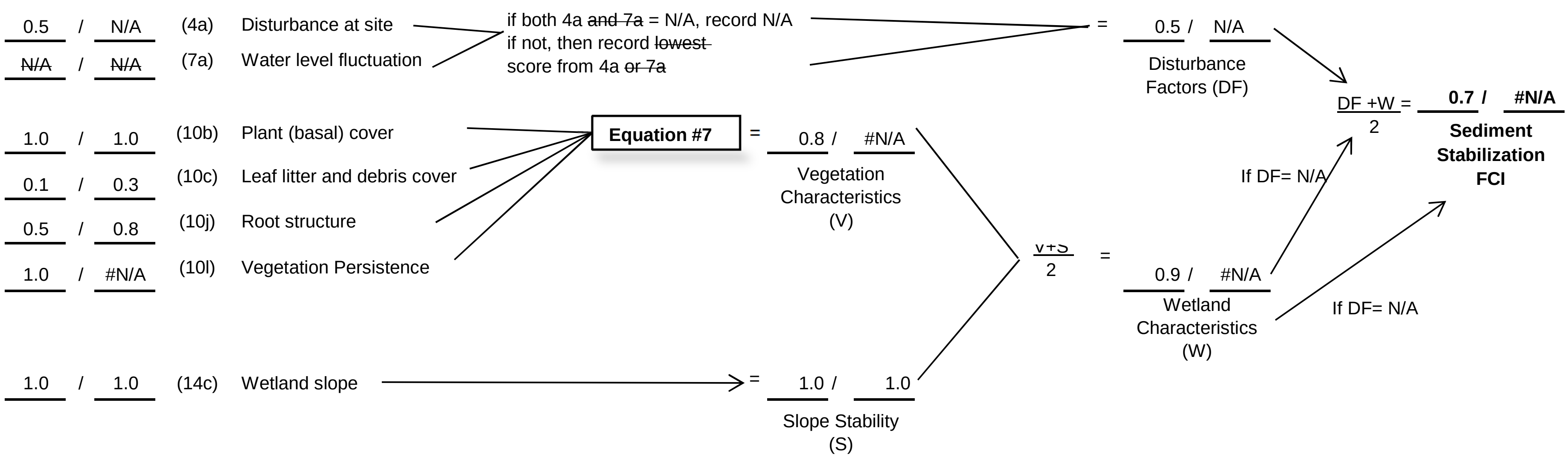
~~If 10e not applicable:~~

$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison:________________ / ________________ (e.g., WAA/planned wetland)			
0.5	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	#N/A	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope



if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / #N/A
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / #N/A**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 2

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.8 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ = **0.2 / 0.4**
Wildlife FCI

Westchester County Center

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative A Year 2

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.89	5.36	4.757	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.95	5.36	5.092	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.61	5.36	3.256	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.53	5.36	2.830	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.69	5.36	3.723	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA

**Target FCI = *goal* established by decision makers

R = multiplying factor established by decision makers

Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)

Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)

Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0

Potential for Erosion (E)

0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.7	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) Shoreline structures/obstacles → 3= 0.5 / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

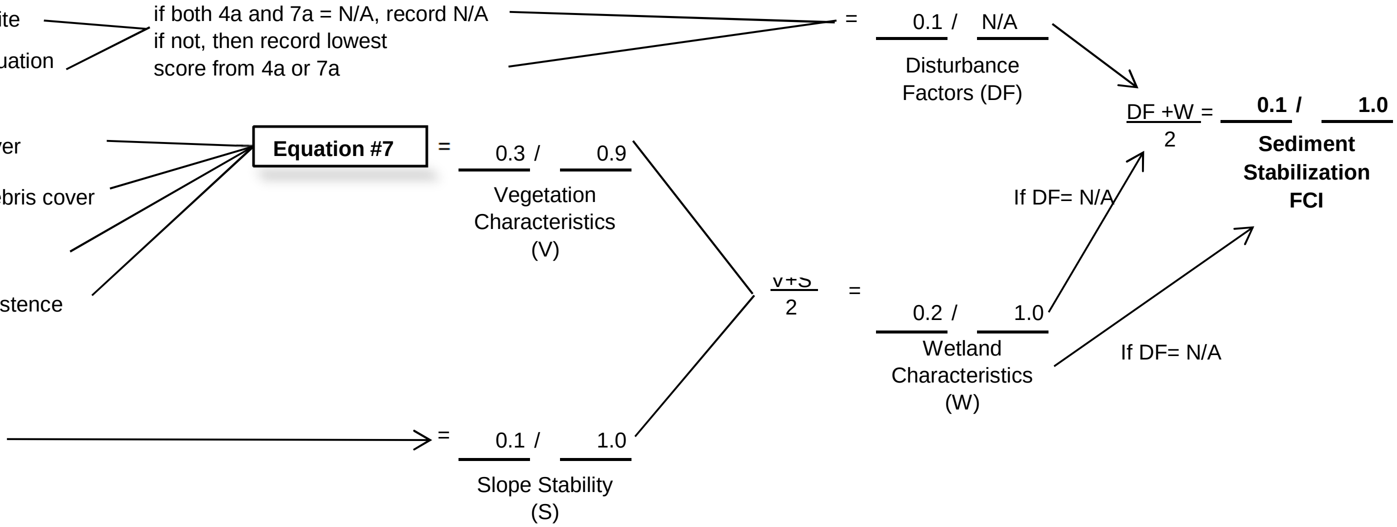
$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Sediment Stabilization

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5	N/A	(4a)	Disturbance at site
0.1	N/A	(7a)	Water level fluctuation
0.3	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope



(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.9
Vegetation Characteristics (V)

(14c) = 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 1.0
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.1 / 1.0**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1 - 10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
0.1	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = 0.1 / N/A Limiting Factors (LF)
average for elements with available scores

Selected Scores		(#)	Element
0.5	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope

average for elements with available scores: 0.4 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	0.7	(10b)	Plant (basal) cover
0.8	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.6 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.3 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.2 / 0.8 Wetland Condition (C)

If LF = N/A: Wetland Condition (C)

Selected Scores		(#)	Element
1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

Dominant substrate: If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.6 Water Quality (WQ) FCI**

Equation 8:
$$\frac{\mathbf{10b(10h + 10l)}}{\mathbf{2}}$$

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Wildlife

Selected Scores		(#)	Element
Comparison: ______	/ ______	(e.g., WAA/planned wetland)	
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element		Result
0.7	0.7	(11a)	Layers	average for elements with available scores	= 0.5 / 0.7 Vegetation Strata
0.3	0.3	(11b)	Condition of Layers		
N/A	1.0	(11c)	Spatial pattern of shrubs/trees		
0.1	0.2	(12a)	Cover types	average for elements with available scores	= 0.1 / 0.4 Vegetation Cover Types
0.1	0.5	(12b)	Ratio of cover types		
0.1	0.5	(12c)	Cover type interspersion		
N/A	N/A	(12d)	Undesirable species		
0.1	0.5	(13a)	% open water	average for elements with available scores	= 0.1 / 0.5 Vegetation/ Water Proportions
0.1	0.5	(13b)	Vegetation/water interspersion		
0.1	1.0	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.1 / 0.6 Physical Features
N/A	N/A	(22a)	Wildlife attractors		
0.1	0.1	(23)	Islands		

average for available scores = 0.2 / 0.5
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.5
Wildlife FCI

`

Project Title:Site 854. Westchester County Center Alternative A Year 2

Calculation of Fish (Non-tidal Stream/River)

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.1	N/A	(1b)	Shoreline bank stability
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.367 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5	1.0	(10m)	Vegetative overhang
0.7	0.7	(10o)	Plant biomass
0.5	1.0	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.5	1.0	(25a)	% pool area
0.1	1.0	(26)	Bank account

average for elements with available scores = 0.4 / 0.8 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.5 / 0.7**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative A Year 2

Calculation of Wildlife (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative B Year 2

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.89	3.90	3.485	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.84	3.90	3.266	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.46	3.90	1.802	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.38	3.90	1.490	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.86	3.90	3.358	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
0.1 /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.8 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.1 / 0.8** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

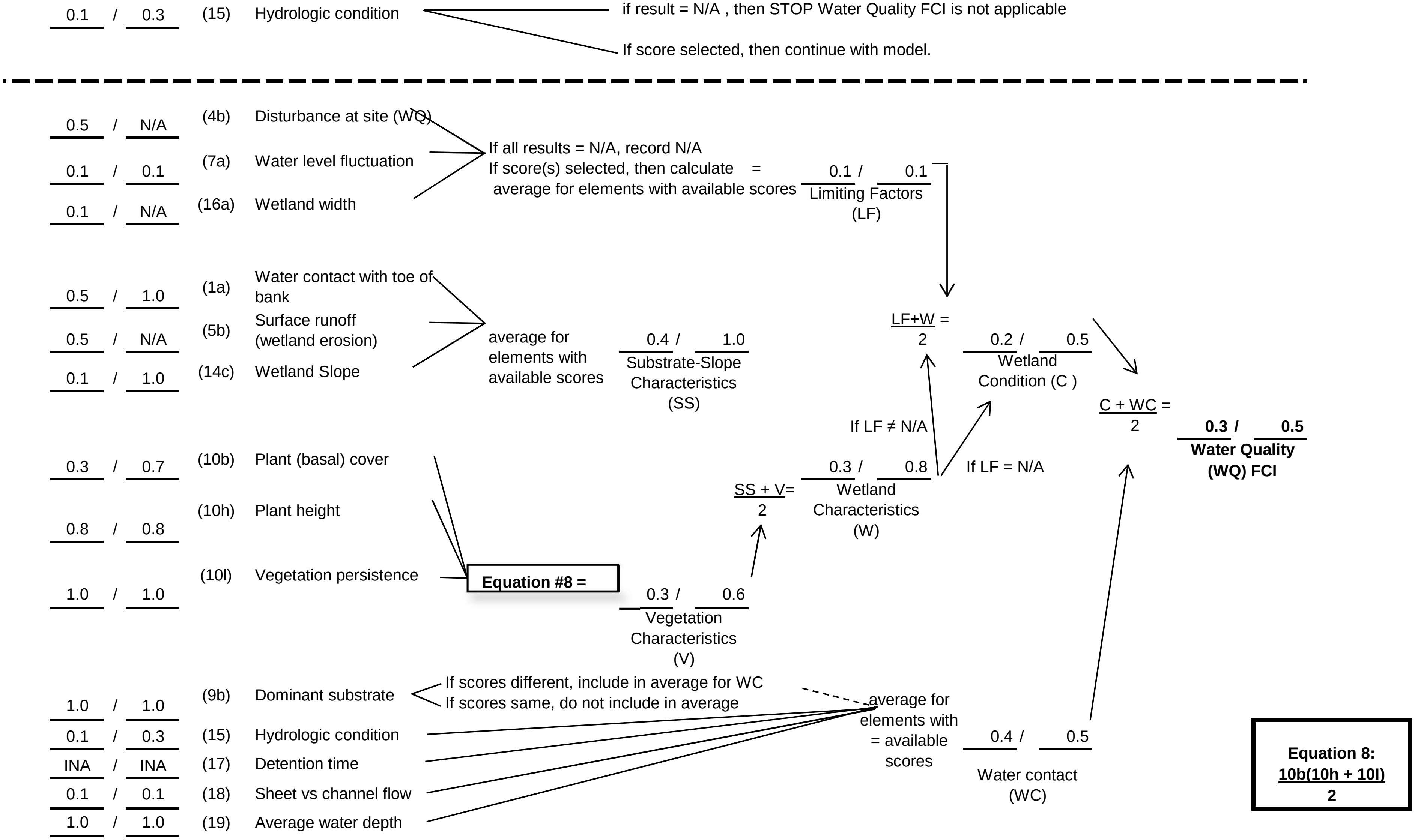
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



0.1 / 0.3 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
0.1	0.1	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
0.5	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope

average for elements with available scores 0.4 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	0.7	(10b)	Plant (basal) cover
0.8	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.6 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.3 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ = 0.2 / 0.5 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
1.0	1.0	(9b)	Dominant substrate
0.1	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.5 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.5 Water Quality (WQ) FCI**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Wildlife

Comparison:_______________________________ / _______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	N/A	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
N/A	1.0	(11c)	Spatial pattern of shrubs/trees
0.1	0.2	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
0.1	0.5	(13a)	% open water
0.1	0.5	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.5 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.4 Wildlife FCI**

If F = NA: **Wildlife FCI**

`

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element	
N/A / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores	(#)	Element		
0.1 / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.367 / N/A Limiting Factors
0.5 / N/A	(4a)	Disturbance at site (SS)		
0.5 / N/A	(4d)	Disturbance in channel/open water		
N/A / N/A	(16c)	Fish habitat size		
N/A / N/A	(24)	Obstruction to fish passage		

Selected Scores	(#)	Element		
0.5 / 1.0	(10m)	Vegetative overhang	average for elements with available scores	= 0.4 / 0.6 Food/Cover
0.7 / 0.7	(10o)	Plant biomass		
0.5 / 0.5	(21b)	Shape of wetland/water edge		
0.3 / 0.3	(22b)	Available fish cover/attractors		
0.5 / 0.5	(25a)	% pool area		
0.1 / 0.5	(26)	Bank account		

Selected Scores	(#)	Element		
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction
0.5 0.5	(27a)	Spawning substrate		
N/A N/A	(27b)	Spawning structures		

Selected Scores	(#)	Element	
0.5 / 1.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

Selected Scores	(#)	Element		
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 1.5 Water Quality (WQ)
INA / INA	(20d)	Dissolved Oxygen		
INA / INA	(20e)	pH		
INA / INA	(20f)	Maximum water temperature		
INA / INA	(20g)	Turbidity		

average for available scores = **0.5 / 0.9**

Fish (Non-Tidal Stream/River) FCI

Project Title:Site 854. Westchester County Center Alternative B Year 2

Calculation of Uniqueness/Heritage

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**
Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a~~ and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b (10j + 10l) + 10c (1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative B Year 2

Calculation of Wildlife (Upland)

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.6
Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.4 / 0.5
Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ = **0.3 / 0.3**
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative C Year 2

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.73	3.86	2.802	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.47	3.86	1.812	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.41	3.86	1.585	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.24	3.86	0.932	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.86	3.86	3.328	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Shoreline Bank Erosion Control

Comparison:__________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5	N/A	(4a)	Disturbance at site
0.1	0.1	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / 0.1 Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c) = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.5** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Water Quality

Selected Scores			(#)	Element

Comparison:_________________ / _________________ (e.g., WAA/planned wetland)

0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5	/	N/A	(4b)	Disturbance at site (WQ)
0.1	/	0.1	(7a)	Water level fluctuation
0.1	/	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1
Limiting Factors (LF)

0.5	/	0.7	(1a)	Water contact with toe of bank
0.5	/	N/A	(5b)	Surface runoff (wetland erosion)
0.1	/	1.0	(14c)	Wetland Slope

average for elements with available scores 0.4 / 0.9
Substrate-Slope Characteristics (SS)

0.3	/	0.7	(10b)	Plant (basal) cover
0.8	/	0.8	(10h)	Plant height
1.0	/	1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.6
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.3 / 0.7
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ = 0.2 / 0.4
Wetland Condition (C)

If LF = N/A

1.0	/	1.0	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.1	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4
Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4**
Water Quality (WQ) FCI

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.5 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: **Wildlife FCI**

`

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(24)	Obstruction to fish passage

→ if result = 0.1, STOP. There is no potential for providing tidal fish habitat
→ if result ≠ 0.1 or N/A, then continue with model

Selected Scores	(#)	Element
0.1 / N/A	(1b)	Shoreline bank stability
0.5 / N/A	(4a)	Disturbance at site (SS)
0.5 / N/A	(4d)	Disturbance in channel/open water
N/A / N/A	(16c)	Fish habitat size
N/A / N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / N/A Limiting Factors

Selected Scores	(#)	Element
0.5 / 1.0	(10m)	Vegetative overhang
0.7 / 0.7	(10o)	Plant biomass
0.5 / 0.5	(21b)	Shape of wetland/water edge
0.3 / 0.3	(22b)	Available fish cover/attractors
0.5 / 0.5	(25a)	% pool area
0.1 / 0.5	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

Selected Scores	(#)	Element
N/A / N/A	(25b)	Current velocity within pools
0.5 0.5	(27a)	Spawning substrate
N/A N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores	(#)	Element
0.5 / 1.5	(20b)	Water quality rating

→ If score available, record score for WQ
→ If information not available, continue

Selected Scores	(#)	Element
INA / INA	(20c)	Nutrient/sediment/contaminant sources
INA / INA	(20d)	Dissolved Oxygen
INA / INA	(20e)	pH
INA / INA	(20f)	Maximum water temperature
INA / INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 1.5 Water Quality (WQ)

average for available scores = **0.5 / 0.9**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A; if not, then record ~~lowest~~ score from 4a ~~or 7a~~ = 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7** / **0.9** **Sediment Stabilization FCI**

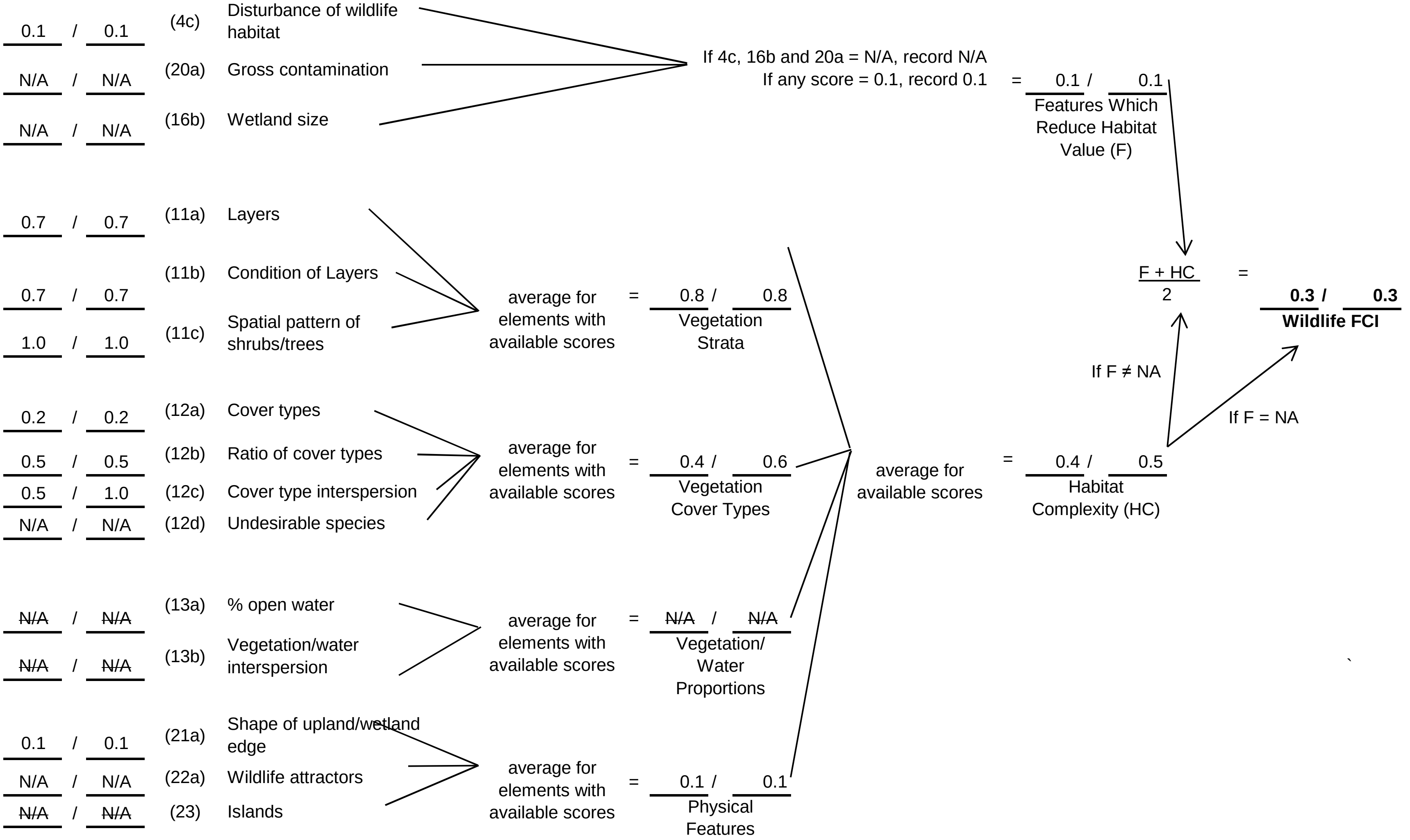
Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 2

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)



Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.7	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8 Vegetation Strata

Selected Scores		(#)	Element
0.2	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ = **0.3 / 0.3**
Wildlife FCI

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EPW Summary Sheets
20 Year

River Park/West Farm Rapids Park

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Comparison between WAA#____________________ and wetland # ____________________

Function	**WAA**			**Goals for Planned Wetland****					**Planned Wetland**			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.66	0.00	0.002	0.69	1	0.0020	0.69	0.0029	0.70	0.35	0.242	Y
SS	0.51	0.00	0.002	0.53	1	0.0015	0.53	0.0029	0.67	0.35	0.231	Y
WQ	0.40	0.00	0.001	0.40	1	0.0012	0.40	0.0030	0.46	0.35	0.161	Y
WL	0.11	0.00	0.000	0.15	1	0.0003	0.15	0.0022	0.18	0.35	0.061	Y
FS	0.26	0.00	0.001	0.40	1	0.0008	0.40	0.0019	0.53	0.35	0.184	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA

**Target FCI = *goal* established by decision makers

R = multiplying factor established by decision makers

Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)

Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)

Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(8a)	Hours of sunlight
0.1	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.1	1.0	(10g)	Plant height
0.1	0.8	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.4 / 0.6

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.3 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.7 /** **0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title:Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:_________________________________ / _________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.3 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.5 / 0.7** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.3 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
1.0 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.1 / 0.3	(10b)	Plant (basal) cover
0.1 / 1.0	(10h)	Plant height
0.1 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 0.4 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores	(#)	Element
0.1 / 1.0	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

C + WC = / 2 **0.4 / 0.5 Water Quality (WQ)**

Equation 8:
10b(10h + 10l)
2

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.3 / 0.7	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
N/A / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.2 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.2
Wildlife FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
N/A	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
0.1	/	0.5	(4d)	Disturbance in channel/open water
0.1	/	N/A	(16c)	Fish habitat size
N/A	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.233 / 0.5 Limiting Factors

Selected Scores			(#)	Element
N/A	/	0.5	(10m)	Vegetative overhang
0.1	/	0.3	(10o)	Plant biomass
0.1	/	0.5	(21b)	Shape of wetland/water edge
0.1	/	0.3	(22b)	Available fish cover/attractors
0.1	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.1 / 0.4 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.5	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
0.1	/	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.3 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Upland Erosion Control

Comparison:______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
0.1	0.1	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted] 1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.3

Physical Influences on Rate of Erosion

Equation #6 = 0.2 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.3 / #####**

Influences on Rate of Erosion (I)

E + I =
2 ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
~~10a (10g + 10i + 10k)~~
~~3~~2

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:____________________________ / ____________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	0.1	(14c)	Wetland slope

if ~~both~~ 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.3
Vegetation Characteristics (V)

= 0.1 / 0.1
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.2
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.2**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 20

Calculation of Wildlife (Upland)

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees
0.1	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: HC = **Wildlife FCI**

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20
Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.52	1.17	0.605	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.84	1.17	0.983	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.43	1.17	0.506	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.26	1.17	0.304	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.41	1.17	0.479	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.3 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.3

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.5**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation = 0.3 / 0.7
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.6 /** **0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

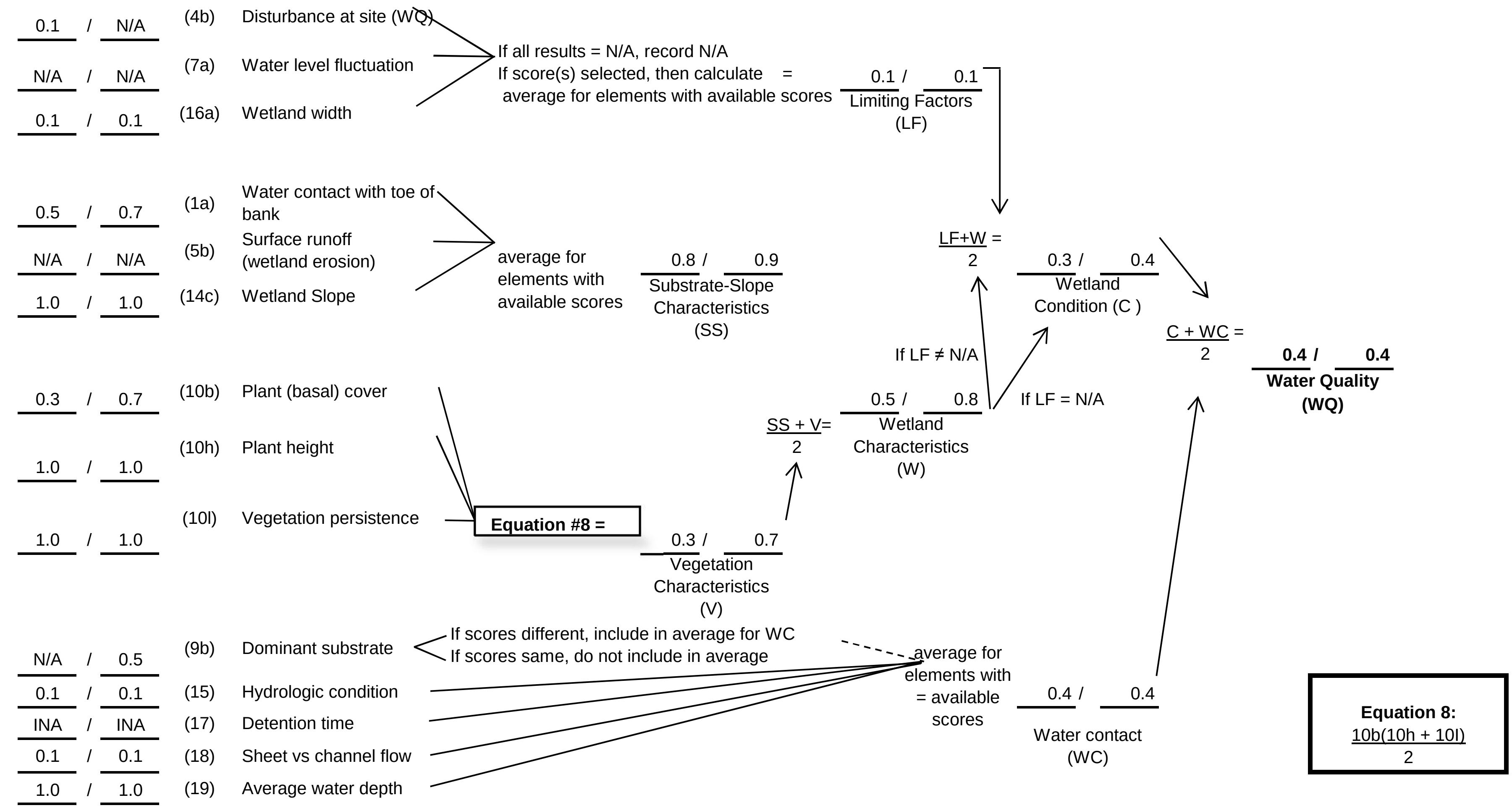
Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1 / 0.1		(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



Selected Scores	(#)	Element
0.1 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
N/A / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ)

Equation 8:

$\frac{10b(10h + 10l)}{2}$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size
1.0	1.0	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
N/A	N/A	(11c)	Spatial pattern of shrubs/trees
0.1	0.3	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	0.5	(12c)	Cover type interspersion
0.1	N/A	(12d)	Undesirable species
0.5	0.5	(13a)	% open water
0.1	0.5	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.3 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.3
Wildlife FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
0.5 / 0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores	(#)	Element
0.5 / N/A	(1b)	Shoreline bank stability
N/A / N/A	(4a)	Disturbance at site (SS)
N/A / N/A	(4d)	Disturbance in channel/open water
N/A / N/A	(16c)	Fish habitat size
0.5 / 0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores	(#)	Element
0.1 / 0.5	(10m)	Vegetative overhang
0.3 / 0.3	(10o)	Plant biomass
0.5 / 0.5	(21b)	Shape of wetland/water edge
0.3 / 0.8	(22b)	Available fish cover/attractors
1.0 / 1.0	(25a)	% pool area
0.1 / 0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores	(#)	Element
N/A / N/A	(25b)	Current velocity within pools
0.5 0.5	(27a)	Spawning substrate
N/A N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores	(#)	Element
INA / INA	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores	(#)	Element
0.1 / 0.1	(20c)	Nutrient/sediment/contaminant sources
INA / INA	(20d)	Dissolved Oxygen
INA / INA	(20e)	pH
INA / INA	(20f)	Maximum water temperature
INA / INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title:Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.2**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **~~N/A~~ / ~~N/A~~**

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1 /	0.5	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.5 Disturbance Factors (DF)

Equat = 0.5 / 0.5 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.4 /** **0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 20

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size
1.0	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	0.1	(11c)	Spatial pattern of shrubs/trees
0.1	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
1.0	1.0	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

4c, 20a, 16b: If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

11a, 11b, 11c: average for elements with available scores = 0.9 / 0.5 Vegetation Strata

12a–12d: average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

13a, 13b: average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

21a, 22a, 23: average for elements with available scores = 0.6 / 0.6 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA: HC =

0.4 / 0.5
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.66	0.00	0.002	0.69	1	0.0020	0.69	0.0029	0.70	0.07	0.047	Y
SS	0.51	0.00	0.002	0.53	1	0.0015	0.53	0.0029	0.53	0.07	0.035	Y
WQ	0.40	0.00	0.001	0.40	1	0.0012	0.40	0.0030	0.36	0.07	0.024	Y
WL	0.11	0.00	0.000	0.15	1	0.0003	0.15	0.0022	0.16	0.07	0.011	Y
FS	0.26	0.00	0.001	0.40	1	0.0008	0.40	0.0019	0.44	0.07	0.030	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA

**Target FCI = *goal* established by decision makers

R = multiplying factor established by decision makers

Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)

Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)

Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(8a)	Hours of sunlight
0.1	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.1	1.0	(10g)	Plant height
0.1	1.0	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.4 / 0.6

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.3 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.7 /** **0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title:Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.1	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.1 /	0.1	(10j)	Root structure
0.1 /	0.1	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.1 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.5 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.5** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Water Quality

Selected Scores			(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5	/	N/A	(4b)	Disturbance at site (WQ)
N/A	/	N/A	(7a)	Water level fluctuation
0.1	/	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.3 / 0.1
Limiting Factors (LF)

1.0	/	1.0	(1a)	Water contact with toe of bank
N/A	/	N/A	(5b)	Surface runoff (wetland erosion)
1.0	/	1.0	(14c)	Wetland Slope

average for elements with available scores

1.0 / 1.0
Substrate-Slope Characteristics (SS)

0.1	/	0.1	(10b)	Plant (basal) cover
0.1	/	1.0	(10h)	Plant height
0.1	/	0.1	(10l)	Vegetation persistence

Equation #8 =

0.0 / 0.1
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.5
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.4 / 0.3
Wetland Condition (C)

0.1	/	0.1	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.1	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4

Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ)

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.3 / 0.5	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
N/A / N/A	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.2 / 0.6 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.1 / 0.2 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.1 / 0.2 Wildlife FCI**

If F = NA: HC = **Wildlife FCI**

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
N/A	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
0.1	/	0.5	(4d)	Disturbance in channel/open water
0.1	/	0.1	(16c)	Fish habitat size
N/A	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.233 / 0.3 Limiting Factors

Selected Scores			(#)	Element
N/A	/	0.1	(10m)	Vegetative overhang
0.1	/	0.1	(10o)	Plant biomass
0.1	/	0.1	(21b)	Shape of wetland/water edge
0.1	/	0.3	(22b)	Available fish cover/attractors
0.1	/	0.5	(25a)	% pool area
N/A	/	N/A	(26)	Bank account

average for elements with available scores = 0.1 / 0.2 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.5	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
0.1	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.3 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
0.1	0.1	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.3

Physical Influences on Rate of Erosion

Equation #6 = 0.2 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.3 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	0.1	(14c)	Wetland slope

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

if ~~both~~ 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.3
Vegetation Characteristics (V)

= 0.1 / 0.1
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.2
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.2**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 20

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a)–(23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: **0.2 / 0.2 Wildlife FCI**

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Bronx Zoo and Dam

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.53	1.45	0.768	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.84	1.45	1.219	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.43	1.45	0.627	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.34	1.45	0.499	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.41	1.45	0.594	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.5	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.3 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.5**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:__________ / __________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.3 / 0.7	(10b)	Plant (basal) cover
0.1 / 0.3	(10c)	Leaf litter and debris cover
0.5 / 0.8	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation = 0.3 / 0.7
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.1	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate =
average for elements with available scores

0.1 / 0.1
Limiting Factors
(LF)

0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.9
Substrate-Slope Characteristics
(SS)

0.3	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7
Vegetation Characteristics
(V)

$\frac{SS + V}{2}$=

0.5 / 0.8
Wetland Characteristics
(W)

If LF ≠ N/A

If LF = N/A

$\frac{LF+W}{2}$ =

0.3 / 0.4
Wetland Condition (C)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ) FCI

N/A	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4
Water contact
(WC)

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
1.0 / 1.0	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
0.1 / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 1.0	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.9
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.3 / 0.4
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.6
Physical Features

average for available scores = 0.3 / 0.6
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.3
Wildlife FCI

`

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	0.5	(24)	Obstruction to fish passage

- if result = 0.1, STOP. There is no potential for providing tidal fish habitat
- if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.3 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
1.0 /	1.0	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
INA /	INA	(20b)	Water quality rating

- If score available, record score for WQ
- If information not available, continue

Selected Scores		(#)	Element
0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title:Site 861. Bronx Zoo Alternative A Year 20

Calculation of Uniqueness/Heritage

Comparison:____________________________ / ____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.2**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1 /	0.5	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.5 Disturbance Factors (DF)

Equat = 0.5 / 0.5 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.4 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 20

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element		
0.1 / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / N/A Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination		
N/A / N/A	(16b)	Wetland size		
1.0 / 0.7	(11a)	Layers	average for elements with available scores	= 0.9 / 0.5 Vegetation Strata
0.7 / 0.7	(11b)	Condition of Layers		
1.0 / 0.1	(11c)	Spatial pattern of shrubs/trees		
0.1 / 0.2	(12a)	Cover types	average for elements with available scores	= 0.4 / 0.6 Vegetation Cover Types
0.5 / 0.5	(12b)	Ratio of cover types		
0.5 / 1.0	(12c)	Cover type interspersion		
N/A / N/A	(12d)	Undesirable species		
~~N/A~~ / ~~N/A~~	(13a)	% open water	average for elements with available scores	= ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion		
0.1 / 0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.6 / 0.1 Physical Features
1.0 / N/A	(22a)	Wildlife attractors		
~~N/A~~ / ~~N/A~~	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions and Physical Features: average for available scores = 0.6 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.4 / 0.4
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.52	1.17	0.605	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.84	1.17	0.983	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.43	1.17	0.506	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.26	1.17	0.304	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.41	1.17	0.479	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A
Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.1 / 0.1
Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.3 / 0.6
Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.3
Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.5**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

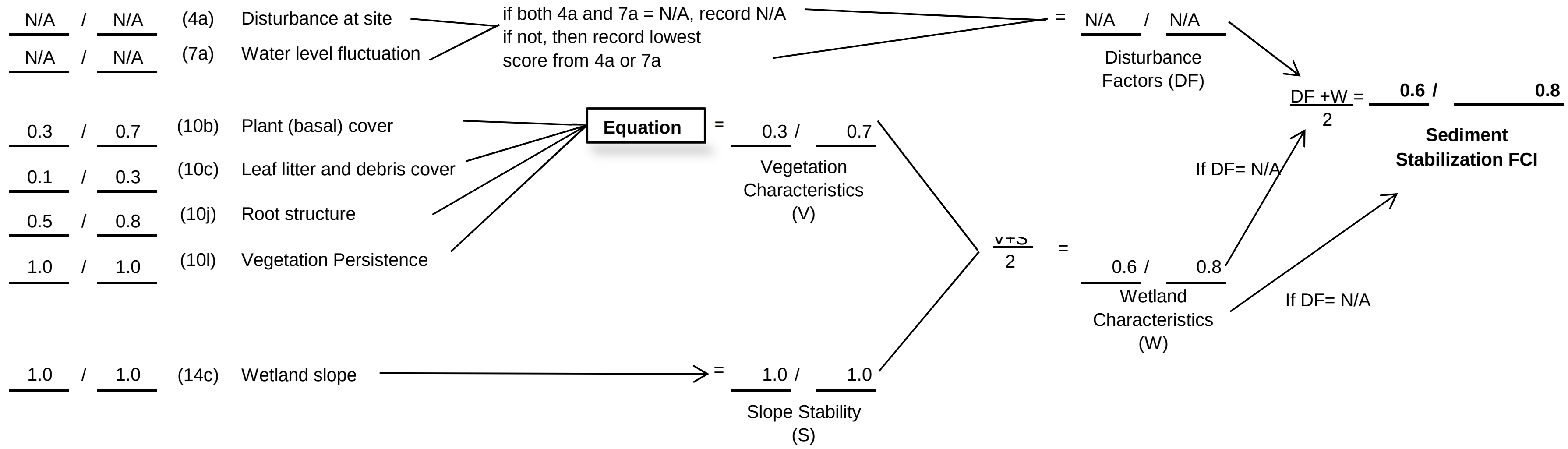
Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Sediment Stabilization

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)



Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.8	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A Disturbance Factors (DF)

Equation = 0.3 / 0.7 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

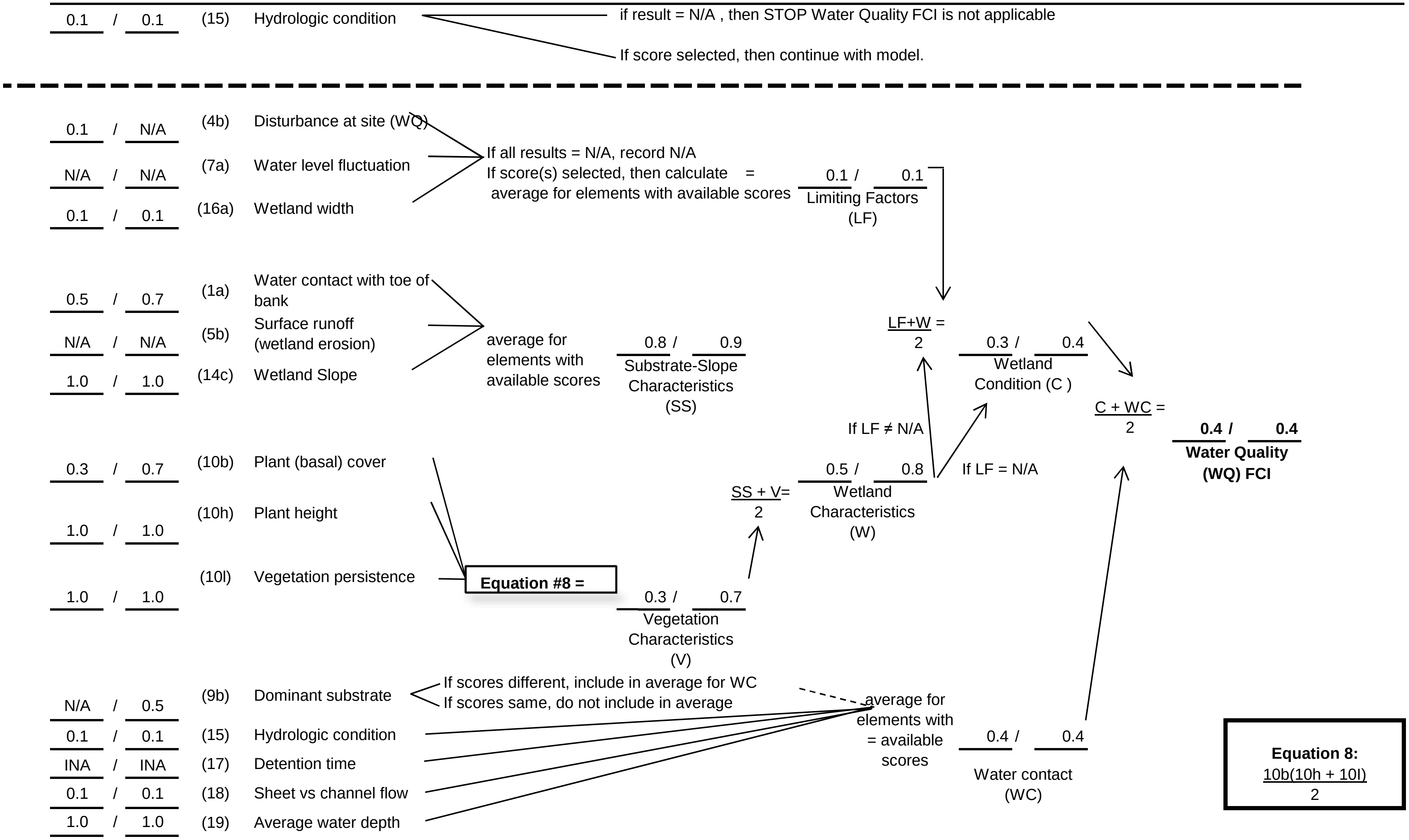
Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)



Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition
0.1 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width
0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence
N/A / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Wildlife

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

1.0 / 1.0	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7
Vegetation Strata

0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
0.1 / N/A	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.4
Vegetation Cover Types

0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.4
Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ =

0.2 / 0.3
Wildlife FCI

`

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 /	0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

0.5 /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

0.1 /	0.5	(10m)	Vegetative overhang
0.3 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
1.0 /	1.0	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

INA /	INA	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.2**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.5	(4a)	Disturbance at site
~~N/A~~ / ~~N/A~~	(7a)	Water level fluctuation
0.3 / 0.3	(10b)	Plant (basal) cover
0.7 / 0.7	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.5 Disturbance Factors (DF)

Equat = 0.5 / 0.5 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

If DF= N/A

$\frac{DF + W}{2}$ = **0.4 / 0.6** **Sediment Stabilization FCI**

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 20

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
1.0 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 0.1	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.9 / 0.5
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.6
Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.6
Physical Features

average for available scores = 0.6 / 0.5
Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ = **0.4 / 0.5**
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Comparison between WAA#_____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.35	0.97	0.341	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.77	0.97	0.744	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.42	0.97	0.405	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.25	0.97	0.238	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.39	0.97	0.374	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.5	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.5

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.3 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.2

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.4**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Sediment Stabilization

Selected Scores			(#)	Element
				Comparison:_______________ / _______________ (e.g., WAA/planned wetland)
N/A	/	N/A	(4a)	Disturbance at site
N/A	/	N/A	(7a)	Water level fluctuation
0.3	/	0.7	(10b)	Plant (basal) cover
0.1	/	0.1	(10c)	Leaf litter and debris cover
0.5	/	0.5	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
1.0	/	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation = 0.3 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.1 / 0.1	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.5	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.8 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
N/A / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ) FCI

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size
1.0	1.0	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
N/A	N/A	(11c)	Spatial pattern of shrubs/trees
0.1	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	0.5	(12c)	Cover type interspersion
0.1	0.1	(12d)	Undesirable species
0.5	0.5	(13a)	% open water
0.1	0.5	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.3 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: **Wildlife FCI**

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
0.5	/	0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
0.5	/	0.5	(1b)	Shoreline bank stability
N/A	/	N/A	(4a)	Disturbance at site (SS)
N/A	/	N/A	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
0.5	/	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores			(#)	Element
0.1	/	0.5	(10m)	Vegetative overhang
0.3	/	0.3	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.3	(22b)	Available fish cover/attractors
1.0	/	1.0	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.5		0.5	(27a)	Spawning substrate
N/A		N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores			(#)	Element
INA	/	INA	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
0.1	/	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	/ N/A	(29)	Endangered species
N/A	/ N/A	(30)	Rarity
N/A	/ N/A	(31)	Unique features
N/A	/ N/A	(32)	Historical or archaeological significance
N/A	/ N/A	(33)	Natural landmark
N/A	/ N/A	(34)	Connected to Wild and Scenic River
1.0	/ 1.0	(35)	Park, sanctuary, etc.
N/A	/ N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.4**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4a)	Disturbance at site
~~N/A~~ / ~~N/A~~	(7a)	Water level fluctuation
0.3 / 0.3	(10b)	Plant (basal) cover
0.7 / 0.7	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.1
Disturbance Factors (DF)

Equat = 0.5 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.4 / 0.4**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 20

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
1.0 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 0.1	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.5 / 1.0	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.9 / 0.5 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.7 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.6 / 0.6 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.4 / 0.6
Wildlife FCI

`

Stone Mill Dam

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative A Year 20

Comparison between WAA# and wetland # ____________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.39	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.58	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title:Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.1	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.1
Vegetation Characteristics (V)

(14c) = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.6 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element	
0.1	0.1	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.

Selected Scores		(#)	Element
N/A	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
0.5	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

C + WC = / 2 **0.4 / 0.4 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title:Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.3
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.1
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.1
Wildlife FCI

`

Project Title: Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores			(#)	Element	Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5	/	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

N/A	/	N/A	(1b)	Shoreline bank stability	average for elements with available scores = 0.5 / N/A Limiting Factors
N/A	/	N/A	(4a)	Disturbance at site (SS)	
N/A	/	N/A	(4d)	Disturbance in channel/open water	
N/A	/	N/A	(16c)	Fish habitat size	
0.5	/	N/A	(24)	Obstruction to fish passage	

0.1	/	0.1	(10m)	Vegetative overhang	average for elements with available scores = 0.4 / 0.5 Food/Cover
1.0	/	1.0	(10o)	Plant biomass	
0.5	/	0.5	(21b)	Shape of wetland/water edge	
0.3	/	0.8	(22b)	Available fish cover/attractors	
0.5	/	0.5	(25a)	% pool area	
0.1	/	0.1	(26)	Bank account	

N/A	/	N/A	(25b)	Current velocity within pools	average for elements with available scores = 0.2 / 0.8 Reproduction
0.2		0.5	(27a)	Spawning substrate	
N/A		1.0	(27b)	Spawning structures	

0.5	/	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

INA	/	INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)
INA	/	INA	(20d)	Dissolved Oxygen	
INA	/	INA	(20e)	pH	
#N/A	/	#N/A	(20f)	Maximum water temperature	
#N/A	/	#N/A	(20g)	Turbidity	

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
1.0	1.0	(32)	Historical or archaeological significance
1.0	1.0	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
1.0	1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:_________________________________ / _________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.7 /	1.0	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Comparison between WAA# and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.38	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.61	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores (#) Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Sediment Stabilization

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.1	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.1
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

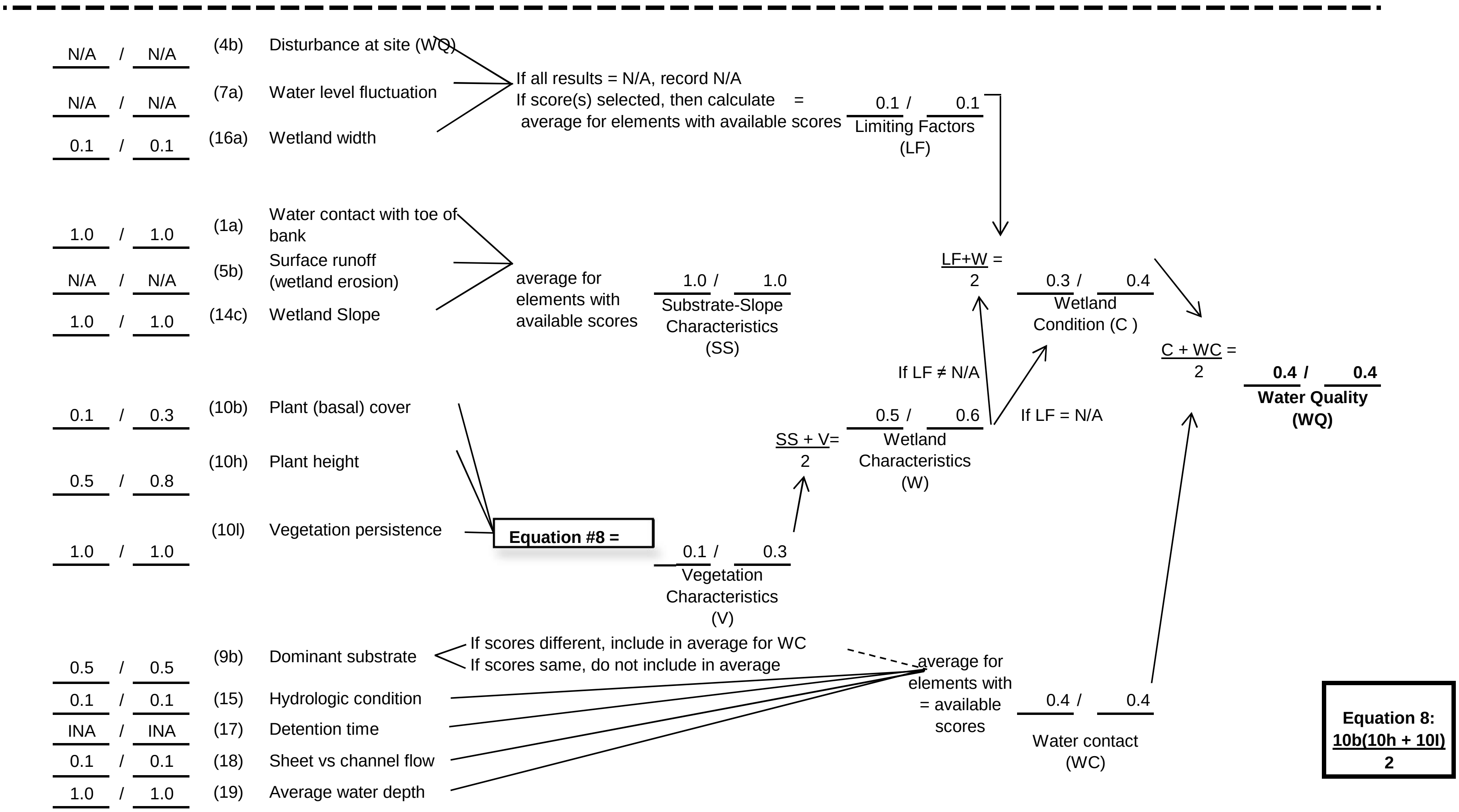
Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



Selected Scores		(#)	Element
N/A	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
0.5	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 0.5 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A

LF+W = / 2 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

C + WC = / 2 **0.4 / 0.4 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.3 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.1 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.1 / 0.1**

If F = NA: **0.1 / 0.1**

Wildlife FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
1.0 /	1.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
#N/A /	#N/A	(20f)	Maximum water temperature
#N/A /	#N/A	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison: ______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	/ N/A	(29)	Endangered species
N/A	/ N/A	(30)	Rarity
N/A	/ N/A	(31)	Unique features
1.0	/ 1.0	(32)	Historical or archaeological significance
1.0	/ 1.0	(33)	Natural landmark
N/A	/ N/A	(34)	Connected to Wild and Scenic River
1.0	/ 1.0	(35)	Park, sanctuary, etc.
1.0	/ 1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / ######

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.7 /	1.0	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a~~ and 7a~~ = N/A, record N/A
if not, then record~~ lowest~~
score from 4a~~ or 7a~~
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.6 / 0.8
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.8 /** **0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Comparison between WAA# and wetland # ____________________

Function	**WAA**			**Goals for Planned Wetland****					**Planned Wetland**			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.46	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.58	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.1	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.1
Vegetation Characteristics (V)

(14c) = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6
Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.6 / 0.6**

If DF= N/A

If DF= N/A

Sediment Stabilization FCI

Equation #7:

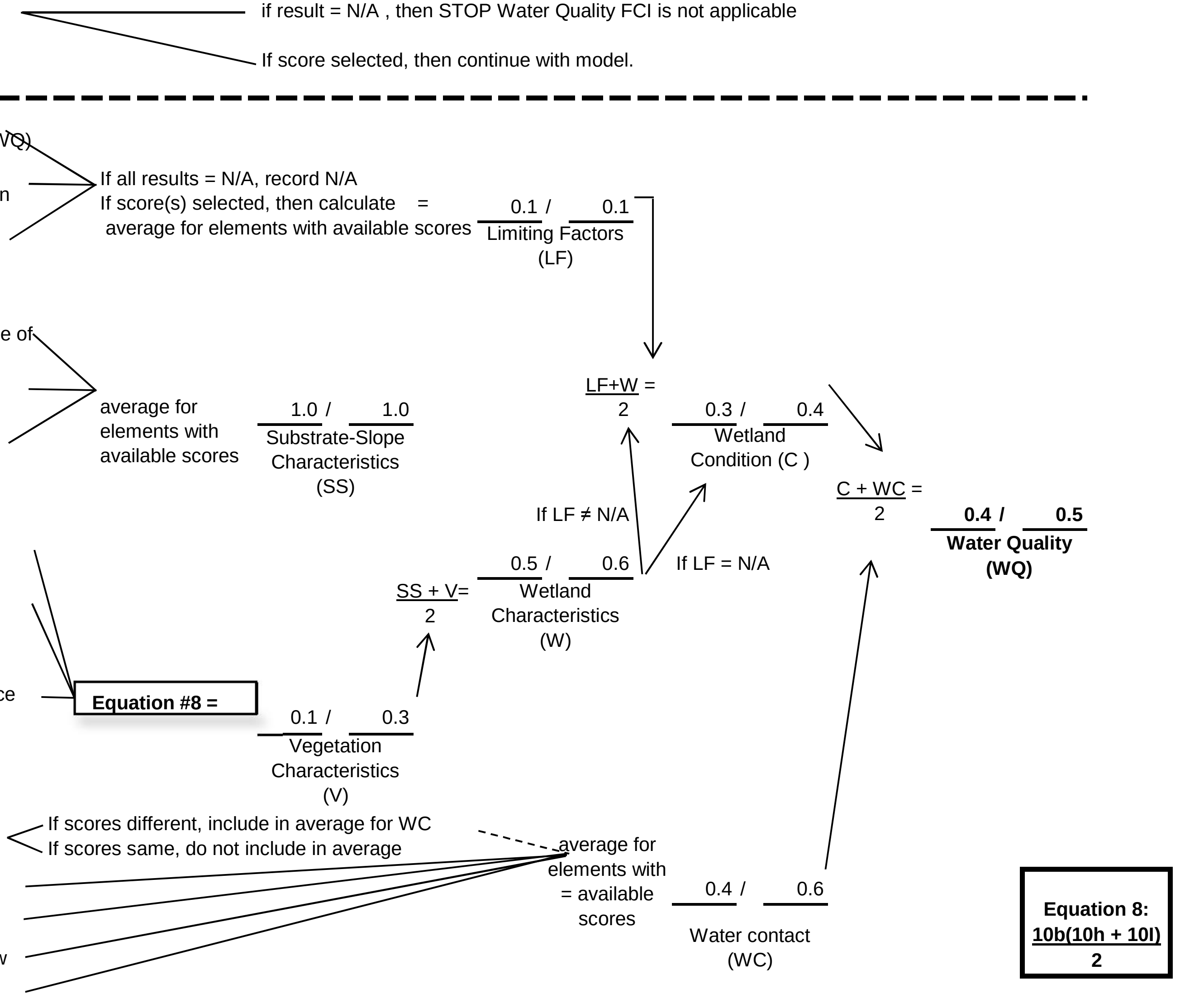
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition
N/A	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
0.5	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth



Hydrologic condition: if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.5 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Wildlife

Selected Scores	(#)	Element

Comparison:_________________________________ / _________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.3 / 0.3
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.1 / 0.1
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.1
Wildlife FCI

`

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:______________________________ / _____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 /	0.5	(24)	Obstruction to fish passage

→ if result = 0.1, STOP. There is no potential for providing tidal fish habitat

→ if result ≠ 0.1 or N/A, then continue with model

- -

N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

0.1 /	0.5	(10m)	Vegetative overhang
1.0 /	1.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

N/A /	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

0.5 /	0.5	(20b)	Water quality rating

→ If score available, record score for WQ

→ If information not available, continue

INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
#N/A /	#N/A	(20f)	Maximum water temperature
#N/A /	#N/A	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
1.0	1.0	(32)	Historical or archaeological significance
1.0	1.0	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
1.0	1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 863. Stone Mill Dam Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.7 /	1.0	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Shoelace Park

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative A Year 20

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.5	1	0.0064	0.5	0.01275	0.71	2.99	2.130	
SS	0.16	0.02	0.003	0.3	1	0.0032	0.3	0.010583	0.86	2.99	2.564	
WQ	0.28	0.02	0.006	0.4	1	0.0056	0.4	0.014115	0.40	2.99	1.187	
WL	0.15	0.02	0.003	0.2	1	0.003	0.2	0.014919	0.22	2.99	0.670	
FS	0.35	0.02	0.007	0.5	1	0.007	0.5	0.014	0.46	2.99	1.362	
UH	1.00			1					1.00			

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.1 /	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.7 Potential for Erosion (E)

(3): 3= N/A / N/A Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.5 / 0.8 Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.6 / 0.7 Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.3 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
0.1	/	N/A	(4a)	Disturbance at site
0.1	/	N/A	(7a)	Water level fluctuation
0.3	/	0.7	(10b)	Plant (basal) cover
0.1	/	0.1	(10c)	Leaf litter and debris cover
1.0	/	1.0	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
0.1	/	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c) = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.1 / N/A	(4b)	Disturbance at site (WQ)
0.1 / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.1 / 0.7	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.2 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
0.5 / 0.5	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.2 / 0.5 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF + W}{2}$ = 0.2 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

Dominant substrate: If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ) FCI**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.6
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.2 / 0.3
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.1	N/A	(1b)	Shoreline bank stability
0.1	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.1 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.1	0.1	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.3 / 0.4 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Uniqueness/Heritage

Selected Scores		(#)	Element
			Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0** / **1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:_________________________________ / _________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a~~ or 7a~~

= 0.1 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.3 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 20

Calculation of Wildlife Upland

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative B Year 20

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.40	1	0.0064	0.60	0.0106	0.71	0.43	0.306	Y
SS	0.16	0.02	0.003	0.30	1	0.0032	0.50	0.0064	0.86	0.43	0.369	Y
WQ	0.28	0.02	0.006	0.40	1	0.0056	0.40	0.0141	0.40	0.43	0.171	Y
WL	0.15	0.02	0.003	0.20	1	0.0030	0.20	0.0149	0.22	0.43	0.096	Y
FS	0.35	0.02	0.007	0.40	1	0.0070	0.40	0.0175	0.46	0.43	0.196	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.1 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.6 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7

Influences on Rate of Erosion (I)

$$\frac{E + I}{2} =$$ **0.3 /** **0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Sediment Stabilization

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4a)	Disturbance at site
0.1 / N/A	(7a)	Water level fluctuation
0.3 / 0.7	(10b)	Plant (basal) cover
0.1 / 0.1	(10c)	Leaf litter and debris cover
1.0 / 1.0	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
0.1 / 1.0	(14c)	Wetland slope

4a, 7a: if both 4a and 7a = N/A, record N/A; if not, then record lowest score from 4a or 7a = 0.1 / N/A Disturbance Factors (DF)

10b, 10c, 10j, 10l: **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

14c: = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

$\frac{DF + W}{2}$ = **0.2 / 0.9** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Water Quality

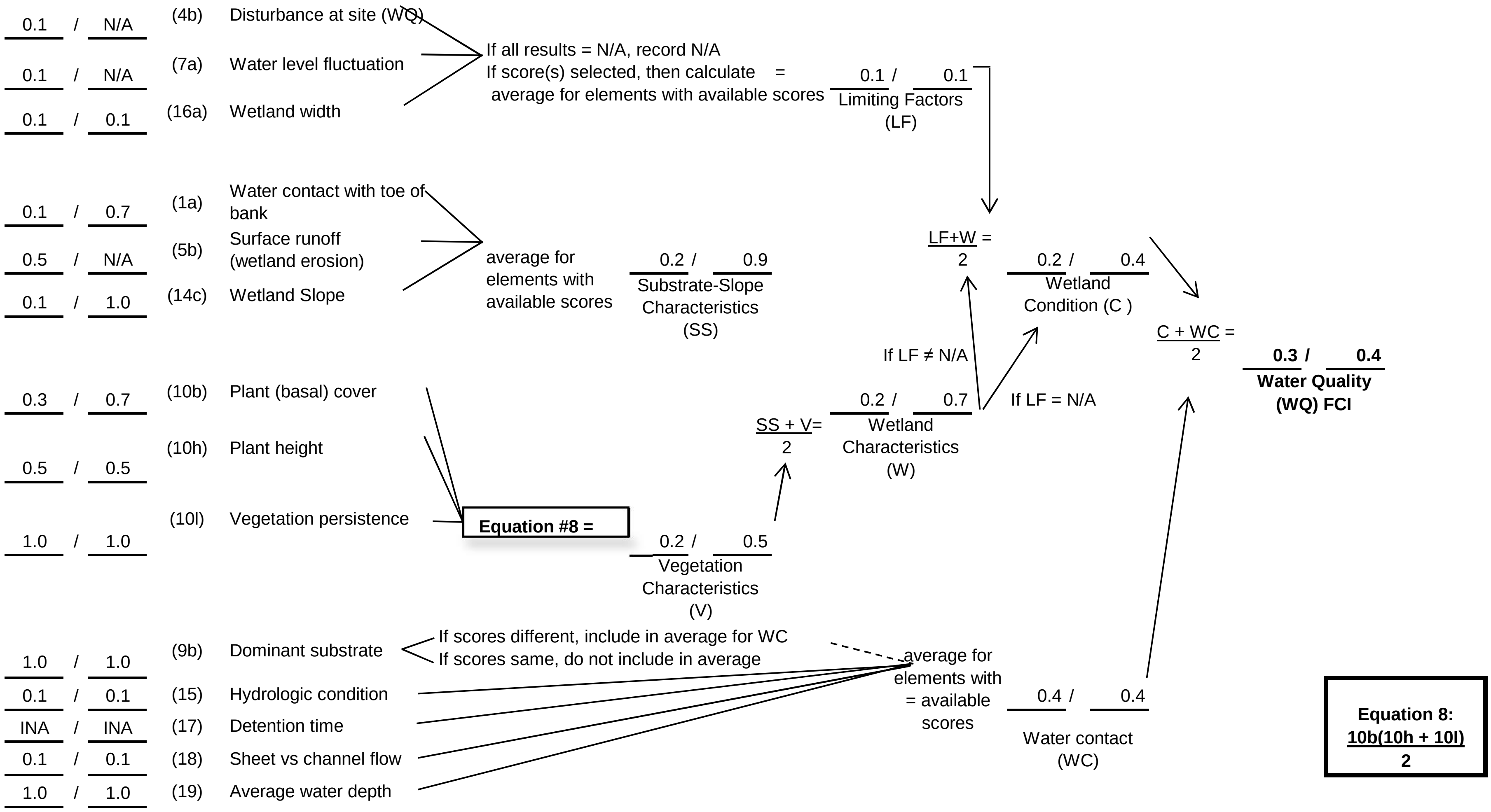
Selected Scores	(#)	Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



0.1 / N/A (4b) Disturbance at site (WQ)

0.1 / N/A (7a) Water level fluctuation

0.1 / 0.1 (16a) Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores =

0.1 / 0.1
Limiting Factors (LF)

0.1 / 0.7 (1a) Water contact with toe of bank

0.5 / N/A (5b) Surface runoff (wetland erosion)

0.1 / 1.0 (14c) Wetland Slope

average for elements with available scores

0.2 / 0.9
Substrate-Slope Characteristics (SS)

0.3 / 0.7 (10b) Plant (basal) cover

0.5 / 0.5 (10h) Plant height

1.0 / 1.0 (10l) Vegetation persistence

Equation #8 =

0.2 / 0.5
Vegetation Characteristics (V)

SS + V= / 2

0.2 / 0.7
Wetland Characteristics (W)

If LF ≠ N/A

LF+W = / 2

If LF = N/A

0.2 / 0.4
Wetland Condition (C)

1.0 / 1.0 (9b) Dominant substrate

If scores different, include in average for WC
If scores same, do not include in average

0.1 / 0.1 (15) Hydrologic condition

INA / INA (17) Detention time

0.1 / 0.1 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with = available scores

0.4 / 0.4
Water contact (WC)

C + WC = / 2

0.3 / 0.4
Water Quality (WQ) FCI

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title:Site 113. Shoelace Park Alternative B Year 20

Calculation of Wildlife

Selected Scores			(#)	Element
				Comparison:__________________ / __________________ (e.g., WAA/planned wetland)
N/A	/	N/A	(4c)	Disturbance of wildlife habitat
N/A	/	N/A	(20a)	Gross contamination
0.1	/	0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

0.5	/	0.5	(11a)	Layers
0.1	/	0.7	(11b)	Condition of Layers
N/A	/	N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.3 / 0.6
Vegetation Strata

0.1	/	0.1	(12a)	Cover types
0.1	/	0.1	(12b)	Ratio of cover types
0.1	/	0.5	(12c)	Cover type interspersion
0.1	/	0.1	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.2
Vegetation Cover Types

0.5	/	0.5	(13a)	% open water
0.1	/	0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

0.1	/	0.1	(21a)	Shape of upland/wetland edge
N/A	/	N/A	(22a)	Wildlife attractors
0.1	/	0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.2 / 0.3
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.1 / 0.2**

If F = NA

Wildlife FCI

`

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element	
N/A / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores	(#)	Element			
0.1 / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.1 / N/A	Limiting Factors
0.1 / N/A	(4a)	Disturbance at site (SS)			
N/A / N/A	(4d)	Disturbance in channel/open water			
N/A / N/A	(16c)	Fish habitat size			
N/A / N/A	(24)	Obstruction to fish passage			
0.5 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.4	Food/Cover
0.3 / 0.3	(10o)	Plant biomass			
0.5 / 0.5	(21b)	Shape of wetland/water edge			
0.3 / 0.3	(22b)	Available fish cover/attractors			
0.1 / 0.1	(25a)	% pool area			
0.1 / 0.5	(26)	Bank account			
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5	Reproduction
0.5 0.5	(27a)	Spawning substrate			
N/A N/A	(27b)	Spawning structures			
0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue		
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5	Water Quality (WQ)
INA / INA	(20d)	Dissolved Oxygen			
INA / INA	(20e)	pH			
INA / INA	(20f)	Maximum water temperature			
INA / INA	(20g)	Turbidity			

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~ Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~ Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5 Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8 Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6** **Influences on Rate of Erosion (I)**

E + I = / 2 ~~N/A~~ / ~~N/A~~ **Shoreline Bank Erosion Control FCI**

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)

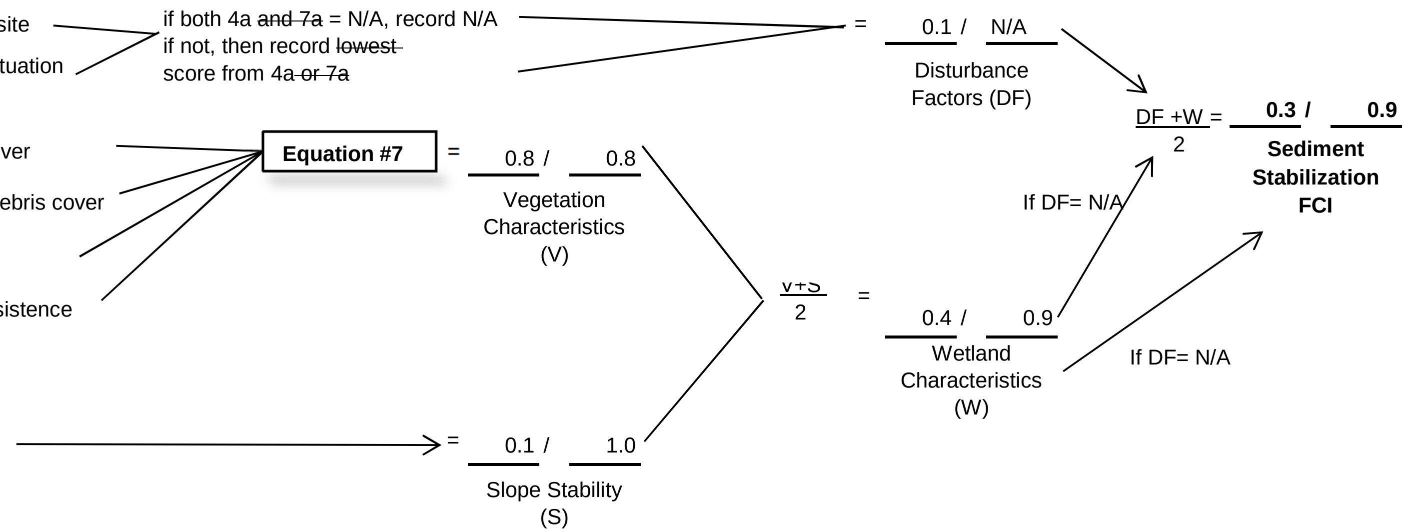
~~3~~2

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope



if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.3 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 20

Calculation of Wildlife Upland

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: HC = **Wildlife FCI**

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Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative C Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.5	1	0.0064	0.5	0.01275	0.61	0.411	0.252	Y
SS	0.16	0.02	0.003	0.3	1	0.0032	0.3	0.010583	0.48	0.411	0.197	Y
WQ	0.28	0.02	0.006	0.4	1	0.0056	0.4	0.014115	0.33	0.411	0.135	Y
WL	0.15	0.02	0.003	0.2	1	0.003	0.2	0.014919	0.22	0.411	0.092	Y
FS	0.35	0.02	0.007	0.5	1	0.007	0.5	0.014	0.47	0.411	0.192	Y
UH	1.00			1					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.1 /	0.5	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.5

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.6 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7

Influences on Rate of Erosion (I)

$$\frac{E + I}{2} =$$ **0.3 / 0.6**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.5	(4a)	Disturbance at site
0.1	0.1	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
1.0	1.0	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a = 0.1 / 0.1 Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c) = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.2 / 0.5** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

0.1 / 0.1	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.

0.1 / 0.5	(4b)	Disturbance at site (WQ)
0.1 / 0.1	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

0.1 / 0.5	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 0.1	(14c)	Wetland Slope

average for elements with available scores 0.2 / 0.3 Substrate-Slope Characteristics (SS)

0.3 / 0.7	(10b)	Plant (basal) cover
0.5 / 0.5	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.2 / 0.5 Vegetation Characteristics (V)

SS + V= / 2 = 0.2 / 0.4 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 = 0.2 / 0.3 Wetland Condition (C)

If LF = N/A: 0.2 / 0.3 Wetland Condition (C)

1.0 / 1.0	(9b)	Dominant substrate	If scores different, include in average for WC If scores same, do not include in average
0.1 / 0.1	(15)	Hydrologic condition	
INA / INA	(17)	Detention time	
0.1 / 0.1	(18)	Sheet vs channel flow	
1.0 / 1.0	(19)	Average water depth	

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

C + WC = / 2 = **0.3 / 0.3 Water Quality (WQ) FCI**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Wildlife

Comparison:_______________ / _______________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.5 / 0.5	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.3 / 0.6 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.1 / 0.2** **Wildlife FCI**

If F = NA

`

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element	
N/A / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores	(#)	Element
0.1 / 0.5	(1b)	Shoreline bank stability
0.1 / N/A	(4a)	Disturbance at site (SS)
N/A / N/A	(4d)	Disturbance in channel/open water
N/A / N/A	(16c)	Fish habitat size
N/A / N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.1 / 0.5 Limiting Factors

Selected Scores	(#)	Element
0.5 / 0.5	(10m)	Vegetative overhang
0.3 / 0.3	(10o)	Plant biomass
0.5 / 0.5	(21b)	Shape of wetland/water edge
0.3 / 0.3	(22b)	Available fish cover/attractors
0.1 / 0.1	(25a)	% pool area
0.1 / 0.5	(26)	Bank account

average for elements with available scores = 0.3 / 0.4 Food/Cover

Selected Scores	(#)	Element
N/A / N/A	(25b)	Current velocity within pools
0.5 / 0.5	(27a)	Spawning substrate
N/A / N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores	(#)	Element	
0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

Selected Scores	(#)	Element
INA / INA	(20c)	Nutrient/sediment/contaminant sources
INA / INA	(20d)	Dissolved Oxygen
INA / INA	(20e)	pH
INA / INA	(20f)	Maximum water temperature
INA / INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0** / **1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Upland Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**
Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~
Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.3 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 20

Calculation of Wildlife Upland

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

Muskrat Cove

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.74	0.67	0.495	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.67	0.445	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.38	0.67	0.257	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.23	0.67	0.152	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.55	0.67	0.368	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

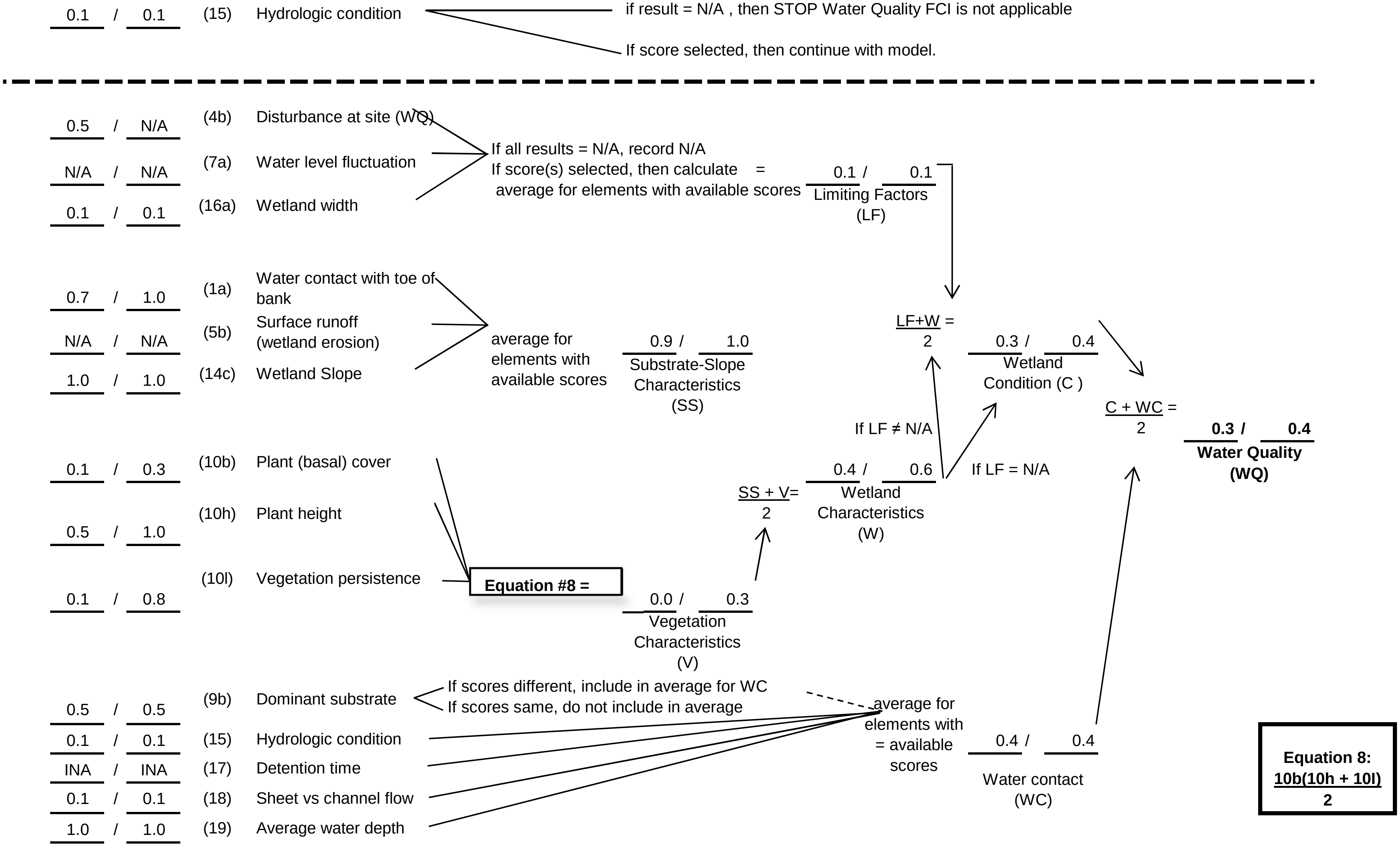
Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition
0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width
0.7 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope
0.1 / 0.3	(10b)	Plant (basal) cover
0.5 / 1.0	(10h)	Plant height
0.1 / 0.8	(10l)	Vegetation persistence
0.5 / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

average for elements with available scores 0.9 / 1.0 Substrate-Slope Characteristics (SS)

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.3 / 0.7	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.0 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / 1.0	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.4
Physical Features

average for available scores = 0.1 / 0.4
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model	

Selected Scores	(#)	Element			
N/A / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / 0.5 Limiting Factors	
N/A / N/A	(4a)	Disturbance at site (SS)			
0.5 / 0.5	(4d)	Disturbance in channel/open water			
N/A / N/A	(16c)	Fish habitat size			
N/A / N/A	(24)	Obstruction to fish passage			
0.1 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.5 Food/Cover	average for available scores = **0.4 / 0.6** **Fish (Non-Tidal Stream/River)**
0.1 / 0.3	(10o)	Plant biomass			
0.5 / 0.5	(21b)	Shape of wetland/water edge			
0.3 / 0.8	(22b)	Available fish cover/attractors			
0.5 / 0.5	(25a)	% pool area			
0.1 / 0.1	(26)	Bank account			
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.8 Reproduction	
0.5 0.5	(27a)	Spawning substrate			
N/A 1.0	(27b)	Spawning structures			
0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue		
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)	
INA / INA	(20d)	Dissolved Oxygen			
INA / INA	(20e)	pH			
INA / INA	(20f)	Maximum water temperature			
INA / INA	(20g)	Turbidity			

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Uniqueness/Heritage

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Upland Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:

~~If 10e not applicable:~~

$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.3 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 20

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = N/A / N/A Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.74	0.67	0.495	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.67	0.445	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.46	0.67	0.307	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.19	0.67	0.127	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.55	0.67	0.368	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Sediment Stabilization

Selected Scores		(#)	Element

Comparison:_____________________________ / _____________________________ (e.g., WAA/planned wetland)

N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.7**
Sediment Stabilization FCI

Equation #7:

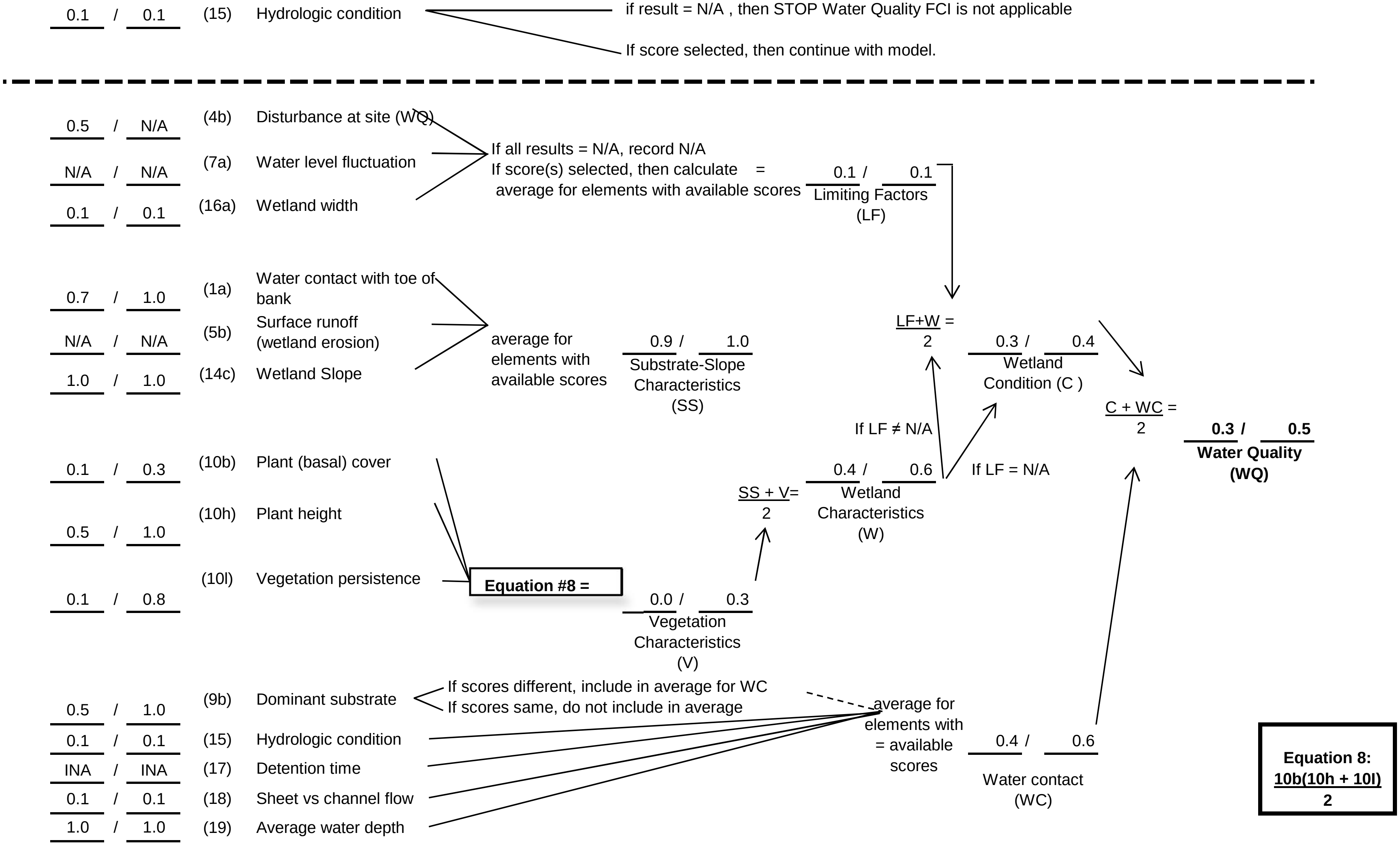
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)



0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5 / N/A (4b) Disturbance at site (WQ)

N/A / N/A (7a) Water level fluctuation

0.1 / 0.1 (16a) Wetland width

If all results = N/A, record N/A

If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

0.7 / 1.0 (1a) Water contact with toe of bank

N/A / N/A (5b) Surface runoff (wetland erosion)

1.0 / 1.0 (14c) Wetland Slope

average for elements with available scores 0.9 / 1.0 Substrate-Slope Characteristics (SS)

0.1 / 0.3 (10b) Plant (basal) cover

0.5 / 1.0 (10h) Plant height

0.1 / 0.8 (10l) Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

0.5 / 1.0 (9b) Dominant substrate

If scores different, include in average for WC

If scores same, do not include in average

0.1 / 0.1 (15) Hydrologic condition

INA / INA (17) Detention time

0.1 / 0.1 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.5 Water Quality (WQ)**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Wildlife

Selected Scores		(#)	Element

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.3	0.7	(11a)	Layers
0.1	0.7	(11b)	Condition of Layers
N/A	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.8
Vegetation Strata

Selected Scores		(#)	Element
0.0	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.1	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

Selected Scores		(#)	Element
0.1	0.1	(13a)	% open water
0.1	0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.1 / 0.3
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:____________________________ / ____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
0.5 /	0.5	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
N/A /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

0.1 /	0.5	(10m)	Vegetative overhang
0.1 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.5 Food/Cover

N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	/ N/A	(29)	Endangered species
N/A	/ N/A	(30)	Rarity
N/A	/ N/A	(31)	Unique features
N/A	/ N/A	(32)	Historical or archaeological significance
N/A	/ N/A	(33)	Natural landmark
N/A	/ N/A	(34)	Connected to Wild and Scenic River
1.0	/ 1.0	(35)	Park, sanctuary, etc.
N/A	/ N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
~~N/A~~ / ~~N/A~~	(7a)	Water level fluctuation
1.0 / 1.0	(10b)	Plant (basal) cover
0.3 / 0.3	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 20

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.7 / 0.7
Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.3
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.59	0.07	0.043	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.07	0.049	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.37	0.07	0.027	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.19	0.07	0.014	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.45	0.07	0.033	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$$\frac{E + I}{2} =$$ **0.5 / 0.6**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.3	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.1	0.5	(10j)	Root structure
0.1	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

4a, 7a: if both 4a and 7a = N/A, record N/A; if not, then record lowest score from 4a or 7a = N/A / N/A Disturbance Factors (DF)

10b, 10c, 10j, 10l: **Equation #7** = 0.1 / 0.3 Vegetation Characteristics (V)

14c: = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.5 / 0.7** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = 0.1 / 0.1
average for elements with available scores

Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores

0.9 / 0.9
Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
0.1	1.0	(10l)	Vegetation persistence

Equation #8 =

0.0 / 0.3
Vegetation Characteristics (V)

$\frac{SS + V}{2} =$

0.4 / 0.6
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF + W}{2} =$

If LF = N/A

0.3 / 0.3
Wetland Condition (C)

Selected Scores		(#)	Element
0.5	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4
Water contact (WC)

$\frac{C + WC}{2} =$

0.3 / 0.4
Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.3	0.7	(11a)	Layers
0.1	0.7	(11b)	Condition of Layers
N/A	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.8 Vegetation Strata

Selected Scores		(#)	Element
0.0	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.1	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

Selected Scores		(#)	Element
0.1	0.1	(13a)	% open water
0.1	0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.1 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	/ N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

N/A	/ N/A	(1b)	Shoreline bank stability
N/A	/ N/A	(4a)	Disturbance at site (SS)
0.5	/ 0.5	(4d)	Disturbance in channel/open water
N/A	/ N/A	(16c)	Fish habitat size
N/A	/ N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

0.1	/ 0.1	(10m)	Vegetative overhang
0.1	/ 0.3	(10o)	Plant biomass
0.5	/ 0.5	(21b)	Shape of wetland/water edge
0.3	/ 0.3	(22b)	Available fish cover/attractors
0.5	/ 0.5	(25a)	% pool area
0.1	/ 0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.3 Food/Cover

N/A	/ N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

0.5	/ 0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

INA	/ INA	(20c)	Nutrient/sediment/contaminant sources
INA	/ INA	(20d)	Dissolved Oxygen
INA	/ INA	(20e)	pH
INA	/ INA	(20f)	Maximum water temperature
INA	/ INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.3	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 20

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Bronxville Lake

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative A Year 20

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.92	4.92	4.511	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.82	4.92	4.012	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.84	4.92	4.123	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.41	4.92	2.024	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.53	4.92	2.626	Y
UH	1.00			1.00					1.00			Y

*FCUs	=	FCU x AREA
**Target FCI	=	*goal* established by decision makers
R	=	multiplying factor established by decision makers
Target FCUs	=	FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI	=	FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area	=	Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a) if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.7 / 1.0

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.1 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.6 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Water Quality

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.3 / 0.3 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5 / N/A (4b) Disturbance at site (WQ)

N/A / N/A (7a) Water level fluctuation

0.1 / N/A (16a) Wetland width

If all results = N/A, record N/A

If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A

Limiting Factors (LF)

0.7 / 1.0 (1a) Water contact with toe of bank

0.5 / N/A (5b) Surface runoff (wetland erosion)

1.0 / 1.0 (14c) Wetland Slope

average for elements with available scores 0.7 / 1.0

Substrate-Slope Characteristics (SS)

0.1 / 0.7 (10b) Plant (basal) cover

1.0 / 1.0 (10h) Plant height

1.0 / 1.0 (10l) Vegetation persistence

Equation #8 = 0.1 / 0.7

Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.9

Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ = 0.3 / 0.9

If LF = N/A

Wetland Condition (C)

0.5 / 1.0 (9b) Dominant substrate

If scores different, include in average for WC

If scores same, do not include in average

0.3 / 0.3 (15) Hydrologic condition

INA / INA (17) Detention time

1.0 / 1.0 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with = available scores 0.8 / 0.8

Water contact (WC)

$\frac{C + WC}{2}$ = **0.5 / 0.8**

Water Quality (WQ)

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8 Vegetation Strata

Selected Scores	(#)	Element
0.2 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.4 Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.3 Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.4 / 0.4 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.2 / 0.4 Wildlife FCI**

If F = NA

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
0.1 /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5 /	1.0	(10m)	Vegetative overhang
0.3 /	0.7	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.1 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
0.1 /	0.5	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Uniqueness/Heritage

Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
			Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)
0.5 /	N/A	(4a)	Disturbance at site
~~N/A /~~	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 1.0**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 851. Bronxville Alternative A Year 20

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.6 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.3**
Wildlife FCI

If F = NA: Habitat Complexity (HC) → **Wildlife FCI**

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Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title:Site 851. Bronxville Alternative B Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.90	3.57	3.225	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.82	3.57	2.935	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.80	3.57	2.855	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.41	3.57	1.456	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.43	3.57	1.517	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

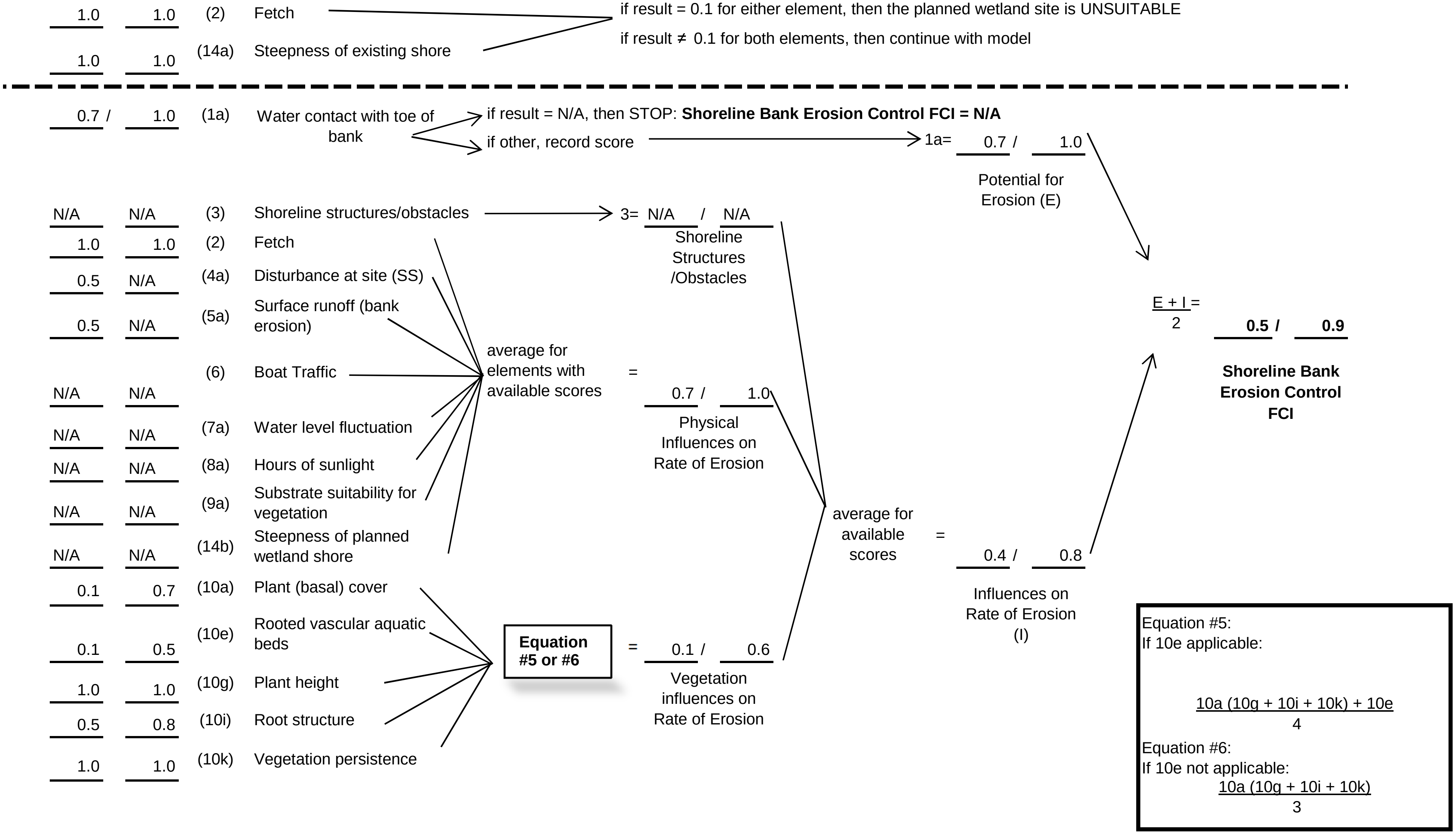
Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model



0.7 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.7 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.1 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Sediment Stabilization

Selected Scores	(#)	Element
Comparison: / (e.g., WAA/planned wetland)		
0.5 / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.7	(10b)	Plant (basal) cover
0.1 / 0.1	(10c)	Leaf litter and debris cover
0.5 / 0.8	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.6 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.8** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Water Quality

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A
Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	0.7	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 0.7 / 0.9
Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.7
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.8
Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF + W}{2}$ = 0.3 / 0.8

If LF = N/A: 0.3 / 0.8
Wetland Condition (C)

Selected Scores		(#)	Element
0.5	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8
Water contact (WC)

$\frac{C + WC}{2}$ = **0.5 / 0.8**
Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Wildlife

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.3 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.3 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.4 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.4** **Wildlife FCI**

If F = NA: **0.2 / 0.4** **Wildlife FCI**

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element	Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5	/ N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

0.5	/ N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.4 / 0.1 Limiting Factors
0.5	/ N/A	(4a)	Disturbance at site (SS)		
N/A	/ N/A	(4d)	Disturbance in channel/open water		
0.1	/ 0.1	(16c)	Fish habitat size		
0.5	/ N/A	(24)	Obstruction to fish passage		
0.5	/ 1.0	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.6 Food/Cover
0.3	/ 0.7	(10o)	Plant biomass		
0.5	/ 0.5	(21b)	Shape of wetland/water edge		
0.3	/ 0.8	(22b)	Available fish cover/attractors		
0.1	/ 0.5	(25a)	% pool area		
0.1	/ 0.1	(26)	Bank account		
N/A	/ N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction
0.5	0.5	(27a)	Spawning substrate		
N/A	N/A	(27b)	Spawning structures		
0.5	/ 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue	
0.1	/ 0.1	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)
INA	/ INA	(20d)	Dissolved Oxygen		
INA	/ INA	(20e)	pH		
INA	/ INA	(20f)	Maximum water temperature		
INA	/ INA	(20g)	Turbidity		

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Upland Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9
Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**
Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~
Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ ~~/~~	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 1.0**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 20

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: **0.2 / 0.2 Wildlife FCI**

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative C Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.75	1.01	0.755	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.58	1.01	0.580	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.60	1.01	0.603	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.37	1.01	0.371	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.59	1.01	0.598	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
0.5	0.5	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.7 / 0.7

Physical Influences on Rate of Erosion

0.1	0.3	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.1 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / 0.5
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.6**

Sediment Stabilization FCI

Equation #7:

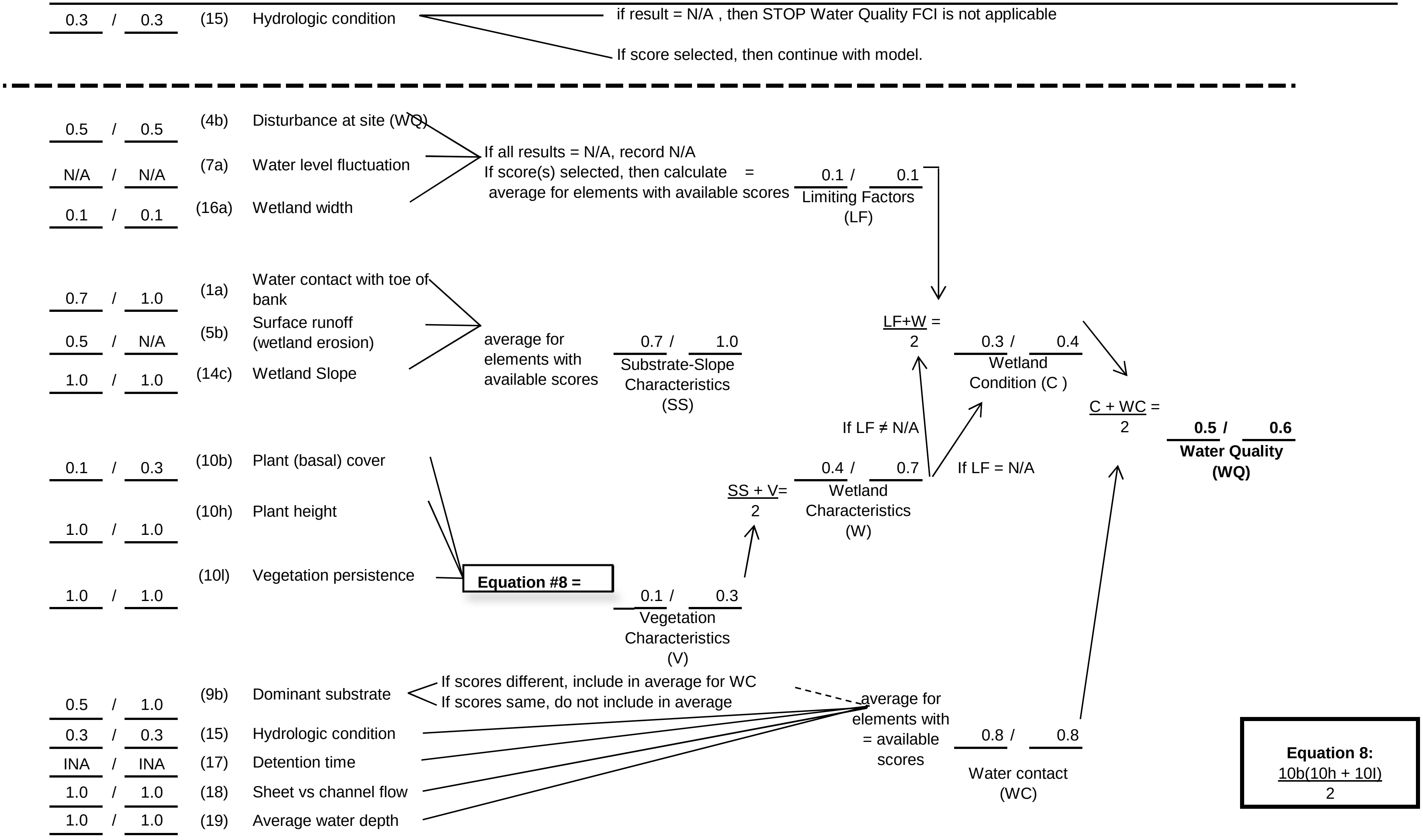
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	0.5	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = 0.1 / 0.1
average for elements with available scores

Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores

0.7 / 1.0
Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 =

0.1 / 0.3
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.4 / 0.7
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

0.3 / 0.4
Wetland Condition (C)

If LF = N/A

$\frac{C + WC}{2}$ =

0.5 / 0.6
Water Quality (WQ)

Selected Scores		(#)	Element
0.5	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.8 / 0.8
Water contact (WC)

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.3 / 0.3 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = 0.3 / 0.3 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.4 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

0.5	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
N/A	/	N/A	(4d)	Disturbance in channel/open water
0.1	/	N/A	(16c)	Fish habitat size
0.5	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / N/A Limiting Factors

0.5	/	0.5	(10m)	Vegetative overhang
0.3	/	0.3	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.8	(22b)	Available fish cover/attractors
0.1	/	1.0	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.5 Food/Cover

N/A	/	N/A	(25b)	Current velocity within pools
0.5		0.5	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

0.1	/	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Uniqueness/Heritage

Selected Scores			(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A /~~	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 1.0**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative C Year 20

Calculation of Wildlife (Upland)

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: HC = **Wildlife FCI**

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Crestwood Lake

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.95	6.28	5.966	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.87	6.28	5.448	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.81	6.28	5.076	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.60	6.28	3.799	Y
FS	0.36	2.00	0.717	0.37	1	0.7167	0.37	1.9369	0.67	6.28	4.222	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

1.0	1.0	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

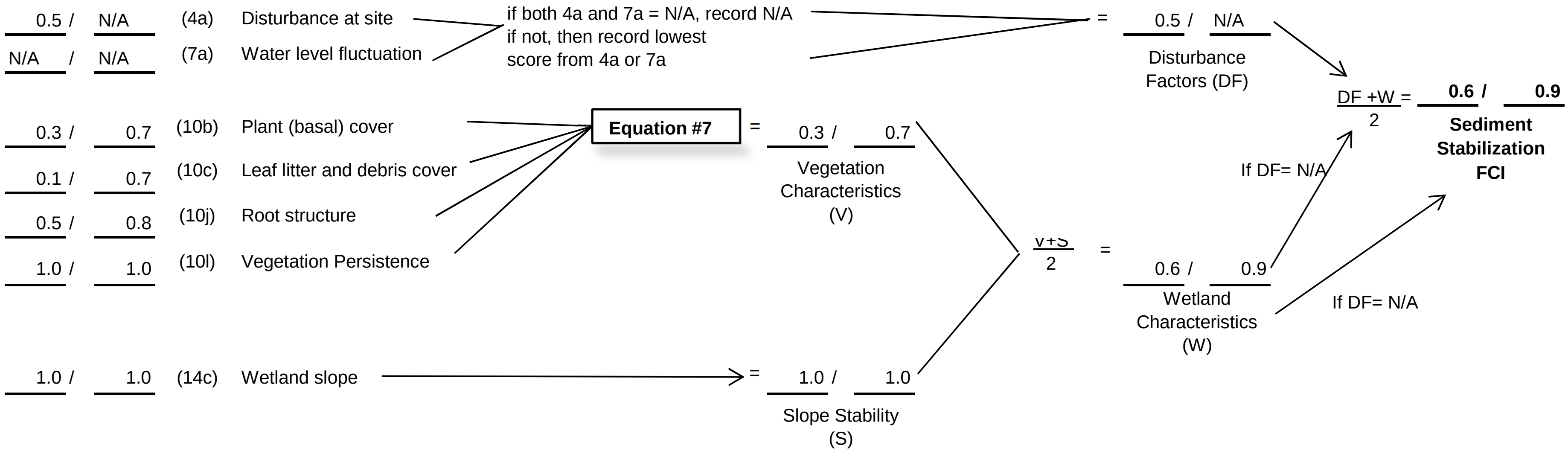
$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Sediment Stabilization

Selected Scores	(#)	Element

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)



0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.3 / 0.7 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.3	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
1.0	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

(4b), (7a), (16a): If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

(1a), (5b), (14c): average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

(10b), (10h), (10l): **Equation #8 =** 0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.7 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.9 Wetland Condition (C)

If LF = N/A

(9b): If scores different, include in average for WC
If scores same, do not include in average

(9b), (15), (17), (18), (19): average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.6 / 0.8 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.5 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.5 / 0.5 Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
1.0 / 1.0	(23)	Islands

average for elements with available scores = 0.7 / 0.7 Physical Features

average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ = **0.3 / 0.6**
Wildlife FCI

`

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.3 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.3	(22b)	Available fish cover/attractors
0.1 /	0.5	(25a)	% pool area
0.1 /	1.0	(26)	Bank account

average for elements with available scores = 0.2 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.2	1.0	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 1.0 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.7**

Fish (Non-Tidal Stream/River)

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Uniqueness/Heritage

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

$\frac{E + I}{2} =$ ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / 0.0
Disturbance Factors (DF)

1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

1.0 /	1.0	(14c)	Wetland slope

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.4**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 20

Calculation of Wildlife (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.9 / 0.9
Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.5 / 0.5
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA

0.3 / 0.3
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.95	2.44	2.317	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.82	2.44	1.987	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.62	2.44	1.514	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.35	2.44	0.848	Y
FS	0.36	2.00	0.717	0.37	1	0.7167	0.37	1.9369	0.38	2.44	0.935	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

- -

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) Shoreline structures/obstacles → 3= N/A / N/A

Shoreline Structures /Obstacles

(2)–(14b): average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

(10a)–(10k): **Equation #5 or #6** = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.6
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.8**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)
0.3 / 0.3		(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
1.0 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.7 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.5 Wetland Condition (C)

If LF = N/A: 0.4 / 0.5 Wetland Condition (C)

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.3 / 0.3	(15)	Hydrologic condition
INA / INA	(17)	Detention time
1.0 / 1.0	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.6 / 0.6 Water Quality (WQ)**

Equation 8:

$\frac{10b(10h + 10l)}{2}$

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.5 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
1.0 / 1.0	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.5 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.7 / 0.7 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3** **Wildlife FCI**

If F = NA: **Wildlife FCI**

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
0.5	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat
if result ≠ 0.1 or N/A, then continue with model

N/A	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
N/A	/	N/A	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
0.5	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

0.1	/	0.5	(10m)	Vegetative overhang
0.3	/	0.3	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.3	(22b)	Available fish cover/attractors
0.1	/	0.1	(25a)	% pool area
0.1	/	1.0	(26)	Bank account

average for elements with available scores = 0.2 / 0.5 Food/Cover

N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.2	(27a)	Spawning substrate
N/A		N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.2 Reproduction

0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ
If information not available, continue

INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.5 / 0.5 Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title:Site 852. Crestwood Lake Alternative B Year 20

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.9 / 0.9
Vegetation Strata

Selected Scores	(#)	Element
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.5 / 0.5
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.3 / 0.3**

If F = NA

Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.96	1.79	1.715	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.67	1.79	1.193	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.57	1.79	1.024	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.35	1.79	0.627	Y
FS	0.36	2.00	0.717	0.40	1	0.7167	0.40	1.7917	0.49	1.79	0.877	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 /** **1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.3 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.7 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.6 / 0.7** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 = 0.7 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 = 0.4 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
1.0	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

C + WC = / 2 = **0.6 / 0.6 Water Quality (WQ)**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Wildlife

Comparison:__________ / __________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element		
N/A / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / 0.1 Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination		
0.1 / 0.1	(16b)	Wetland size		
0.7 / 0.7	(11a)	Layers	average for elements with available scores	= 0.8 / 0.8 Vegetation Strata
0.7 / 0.7	(11b)	Condition of Layers		
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees		
0.1 / 0.2	(12a)	Cover types	average for elements with available scores	= 0.4 / 0.4 Vegetation Cover Types
0.5 / 0.5	(12b)	Ratio of cover types		
0.5 / 0.5	(12c)	Cover type interspersion		
N/A / N/A	(12d)	Undesirable species		
0.5 / 0.5	(13a)	% open water	average for elements with available scores	= 0.5 / 0.5 Vegetation/ Water Proportions
0.5 / 0.5	(13b)	Vegetation/water interspersion		
0.1 / 0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.7 / 0.7 Physical Features
1.0 / 1.0	(22a)	Wildlife attractors		
1.0 / 1.0	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3**

If F = NA: HC

Wildlife FCI

`

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element	Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

N/A	N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / N/A Limiting Factors
0.5	N/A	(4a)	Disturbance at site (SS)		
N/A	N/A	(4d)	Disturbance in channel/open water		
N/A	N/A	(16c)	Fish habitat size		
0.5	N/A	(24)	Obstruction to fish passage		
0.1	0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.2 / 0.4 Food/Cover
0.3	0.3	(10o)	Plant biomass		
0.5	0.5	(21b)	Shape of wetland/water edge		
0.3	0.3	(22b)	Available fish cover/attractors		
0.1	0.5	(25a)	% pool area		
0.1	0.1	(26)	Bank account		
N/A	N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.2 / 0.6 Reproduction
0.2	0.2	(27a)	Spawning substrate		
N/A	1.0	(27b)	Spawning structures		
0.5	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue	
INA	INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)
INA	INA	(20d)	Dissolved Oxygen		
INA	INA	(20e)	pH		
INA	INA	(20f)	Maximum water temperature		
INA	INA	(20g)	Turbidity		

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / 0.5
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.7**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 20

Calculation of Wildlife (Upland)

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.9 / 0.9 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.5 / 0.5 Habitat Complexity (HC)

If F ≠ NA: (F + HC) / 2 = 0.3 / 0.3 **Wildlife FCI**

If F = NA: **Wildlife FCI**

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Harney Road & Garth Woods

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.46	0.20	0.092	0.60	1	0.0919	0.60	0.1531	0.68	0.34	0.230	Y
SS	0.10	0.20	0.020	0.15	1	0.0200	0.15	0.1333	0.18	0.34	0.061	Y
WQ	0.44	0.20	0.088	0.55	1	0.0877	0.55	0.1595	0.59	0.34	0.201	Y
WL	0.23	0.20	0.046	0.40	1	0.0458	0.40	0.1145	0.45	0.34	0.152	Y
FS	0.39	0.20	0.078	0.39	1	0.0775	0.39	0.1987	0.39	0.34	0.131	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.1 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.7

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.678**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Sediment Stabilization

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.3	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.1	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	0.1	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.3
Vegetation Characteristics (V)

(14c): = 0.1 / 0.1
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.2
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.1 / 0.2**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1 - 10b)}{2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Water Quality

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	0.5	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.5 / 0.5 Limiting Factors (LF)

Selected Scores		(#)	Element
0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A $\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.5 Wetland Condition (C)

Selected Scores		(#)	Element
0.1	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.5	0.5	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.5 / 0.7 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.6 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.5 / 1.0	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.3 / 0.7
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.3	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.3
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.4 / 0.4
Physical Features

average for available scores = 0.2 / 0.4
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.4
Wildlife FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5	0.5	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

0.5	0.5	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
0.5	0.5	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

0.1	0.1	(10m)	Vegetative overhang
0.1	0.1	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.8	0.8	(22b)	Available fish cover/attractors
0.5	0.5	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.4 Food/Cover

N/A	N/A	(25b)	Current velocity within pools
0.2	0.2	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.2 Reproduction

0.5	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Uniqueness/Heritage

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.5 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.7**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 20

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.6
Physical Features

average for available scores = 0.6 / 0.6
Habitat Complexity (HC)

If F ≠ NA

If F = NA

$$\frac{F + HC}{2}$$ =

0.6 / 0.6
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative A Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.94	1.62	1.511	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.76	1.62	1.224	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.69	1.62	1.111	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.39	1.62	0.622	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.66	1.62	1.059	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.1	1.0	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0 Potential for Erosion (E)

(3) → 3= N/A / N/A Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 1.0 / 1.0 Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.2 / 0.7 Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.9 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.5 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Water Quality

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

0.1 / 0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A
Limiting Factors (LF)

0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.3 / 0.9
Substrate-Slope Characteristics (SS)

0.1 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.7
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.8
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ = 0.2 / 0.8
Wetland Condition (C)

If LF = N/A

1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.3	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.5	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.6
Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.7**
Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

0.5 / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / N/A Limiting Factors
N/A / N/A	(4a)	Disturbance at site (SS)		
0.5 / N/A	(4d)	Disturbance in channel/open water		
N/A / N/A	(16c)	Fish habitat size		
0.5 / N/A	(24)	Obstruction to fish passage		
0.1 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.2 / 1.0 Food/Cover
0.1 / 3.0	(10o)	Plant biomass		
0.5 / 0.5	(21b)	Shape of wetland/water edge		
0.1 / 0.3	(22b)	Available fish cover/attractors		
0.5 / 1.0	(25a)	% pool area		
0.1 / 0.5	(26)	Bank account		
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction
0.5 / 0.5	(27a)	Spawning substrate		
N/A / N/A	(27b)	Spawning structures		
0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue	
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)
INA / #N/A	(20d)	Dissolved Oxygen		
INA / INA	(20e)	pH		
INA / INA	(20f)	Maximum water temperature		
INA / INA	(20g)	Turbidity		

average for available scores = **0.4 / 0.7**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Uniqueness/Heritage

Selected Scores (#) Element Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
Comparison:____________________ (e.g., WAA/planned wetland)			
Site Suitability For Planned Wetland:			
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / ######

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / ######**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

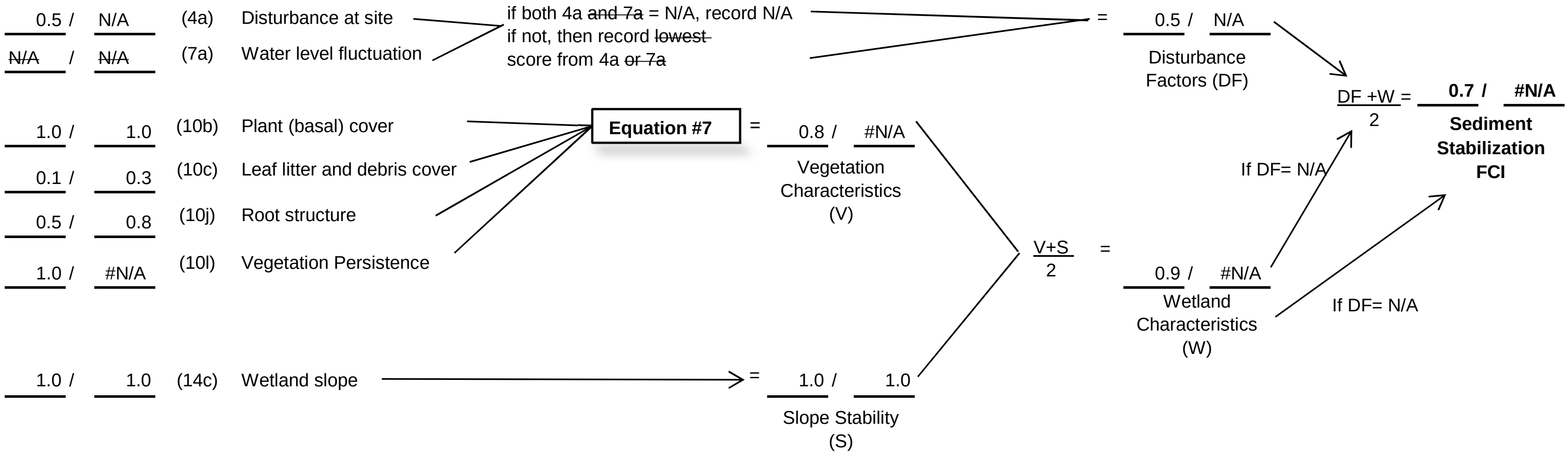
10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	#N/A	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / #N/A
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / #N/A**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 20

Calculation of Wildlife (Upland)

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2
Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative B Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.75	1.02	0.766	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.87	1.02	0.882	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.55	1.02	0.563	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.39	1.02	0.392	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.85	1.02	0.864	Y
UH	1.0			1.00					1.00			Y

*FCUs = FCU x AREA

**Target FCI = *goal* established by decision makers

R = multiplying factor established by decision makers

Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)

Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)

Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.3	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.7
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Water Quality

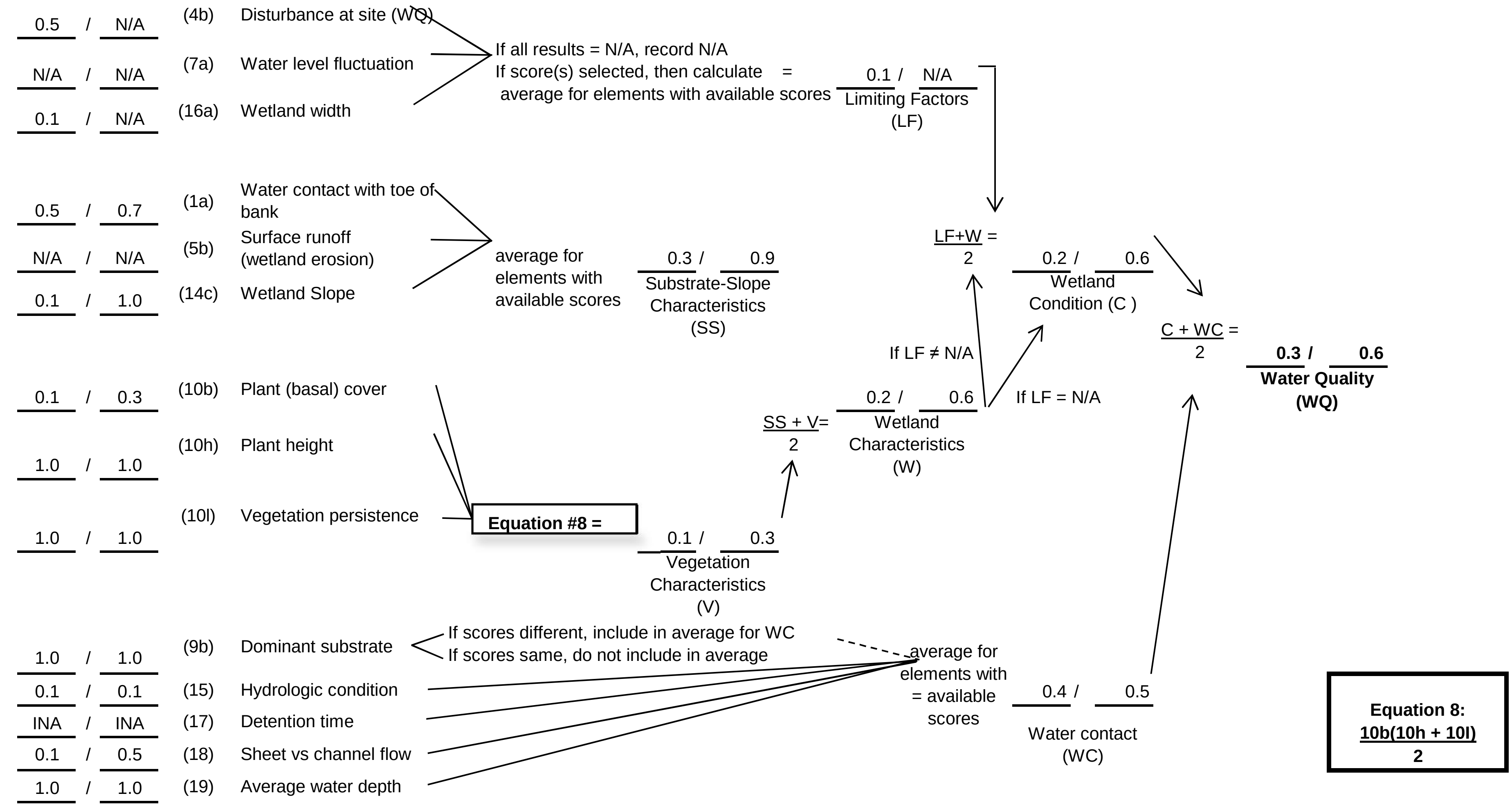
Selected Scores	(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

Selected Scores		(#)	Element
0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF + W}{2}$ = 0.2 / 0.6 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.5	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.5 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.6 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

- if result = 0.1, STOP. There is no potential for providing tidal fish habitat
- if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
0.5 /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.1 /	3.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.1 /	0.8	(22b)	Available fish cover/attractors
0.5 /	1.0	(25a)	% pool area
0.1 /	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.1 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	1.0	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 1.0 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

- If score available, record score for WQ
- If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.9**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Uniqueness/Heritage

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.6 /** #####

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ **/** ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	#N/A	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / #N/A Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / #N/A**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 20

Calculation of Wildlife (Upland)

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative C Year 20

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.75	1.02	0.766	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.69	1.02	0.698	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.54	1.02	0.544	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.34	1.02	0.341	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.66	1.02	0.666	Y
UH	1.0			1.00					1.00			Y

*FCUs = FCU x AREA

**Target FCI = *goal* established by decision makers

R = multiplying factor established by decision makers

Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)

Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)

Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Sediment Stabilization

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.4
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.1 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Water Quality

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5	0.5	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.5 Limiting Factors (LF)

0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

0.1	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF + W}{2}$ = 0.2 / 0.5 Wetland Condition (C)

If LF = N/A: 0.2 / 0.5 Wetland Condition (C)

1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.5	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.5 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.5 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 1.0	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.3	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.3 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.3
Wildlife FCI

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Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
0.5	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
0.5	/	N/A	(1b)	Shoreline bank stability
N/A	/	N/A	(4a)	Disturbance at site (SS)
0.5	/	N/A	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
0.5	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores			(#)	Element
0.1	/	0.5	(10m)	Vegetative overhang
0.1	/	3.0	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.1	/	0.3	(22b)	Available fish cover/attractors
0.5	/	1.0	(25a)	% pool area
0.1	/	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.0 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.5		0.5	(27a)	Spawning substrate
N/A		N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.7**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Upland Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ **/** ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	#N/A	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.5 / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / #N/A
Vegetation Characteristics (V)

(14c) = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A
Wetland Characteristics (W)

$\frac{DF + W}{2}$ = **0.7 / #N/A**
Sediment Stabilization FCI

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 20

Calculation of Wildlife (Upland)

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

Westchester County Center

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative A Year 20

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.89	5.36	4.757	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.95	5.36	5.092	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.61	5.36	3.256	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.53	5.36	2.830	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.69	5.36	3.723	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0

Potential for Erosion (E)

0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.7	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 /** **0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Sediment Stabilization

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
0.1 /	N/A	(7a)	Water level fluctuation
0.3 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.1 / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.9
Vegetation Characteristics (V)

(14c) = 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 1.0
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 1.0**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title:Site 854. Westchester County Center Alternative A Year 20

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5	/	N/A	(4b)	Disturbance at site (WQ)
0.1	/	N/A	(7a)	Water level fluctuation
0.1	/	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

0.5	/	1.0	(1a)	Water contact with toe of bank
0.5	/	N/A	(5b)	Surface runoff (wetland erosion)
0.1	/	1.0	(14c)	Wetland Slope

average for elements with available scores

0.4 / 1.0 Substrate-Slope Characteristics (SS)

0.3	/	0.7	(10b)	Plant (basal) cover
0.8	/	0.8	(10h)	Plant height
1.0	/	1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.6 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.3 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF + W}{2}$ =

If LF = N/A

0.2 / 0.8 Wetland Condition (C)

1.0	/	1.0	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.1	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.3 / 0.6
Water Quality (WQ)

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Wildlife

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element		
N/A / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / N/A Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination		
0.1 / N/A	(16b)	Wetland size		
0.7 / 0.7	(11a)	Layers	average for elements with available scores	= 0.5 / 0.7 Vegetation Strata
0.3 / 0.3	(11b)	Condition of Layers		
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees		
0.1 / 0.2	(12a)	Cover types	average for elements with available scores	= 0.1 / 0.4 Vegetation Cover Types
0.1 / 0.5	(12b)	Ratio of cover types		
0.1 / 0.5	(12c)	Cover type interspersion		
N/A / N/A	(12d)	Undesirable species		
0.1 / 0.5	(13a)	% open water	average for elements with available scores	= 0.1 / 0.5 Vegetation/ Water Proportions
0.1 / 0.5	(13b)	Vegetation/water interspersion		
0.1 / 1.0	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.1 / 0.6 Physical Features
N/A / N/A	(22a)	Wildlife attractors		
0.1 / 0.1	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.5

Wildlife FCI

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores	(#)	Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A / N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

0.1 / N/A	(1b)	Shoreline bank stability
0.5 / N/A	(4a)	Disturbance at site (SS)
0.5 / N/A	(4d)	Disturbance in channel/open water
N/A / N/A	(16c)	Fish habitat size
N/A / N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.367 / N/A Limiting Factors

0.5 / 1.0	(10m)	Vegetative overhang
0.7 / 0.7	(10o)	Plant biomass
0.5 / 1.0	(21b)	Shape of wetland/water edge
0.3 / 0.3	(22b)	Available fish cover/attractors
0.5 / 1.0	(25a)	% pool area
0.1 / 1.0	(26)	Bank account

average for elements with available scores = 0.4 / 0.8 Food/Cover

N/A / N/A	(25b)	Current velocity within pools
0.5 0.5	(27a)	Spawning substrate
N/A 1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

0.5 / 0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

INA / INA	(20c)	Nutrient/sediment/contaminant sources
INA / INA	(20d)	Dissolved Oxygen
INA / INA	(20e)	pH
INA / INA	(20f)	Maximum water temperature
INA / INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.5 / 0.7**

Fish (Non-Tidal Stream/River)

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Uniqueness/Heritage

Selected Scores			(#)	Element

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison:________________ / ________________ (e.g., WAA/planned wetland)			
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a~~ and 7a~~ = N/A, record N/A if not, then record ~~lowest~~ score from 4a ~~or 7a~~ = 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 /** **0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative A Year 20

Calculation of Wildlife (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees
0.2	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA: Habitat Complexity (HC) =

0.3 / 0.3
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative B Year 20

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.89	3.90	3.485	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.84	3.90	3.266	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.46	3.90	1.802	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.38	3.90	1.490	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.86	3.90	3.358	Y
UH	1.00			1.00					1.00			Y

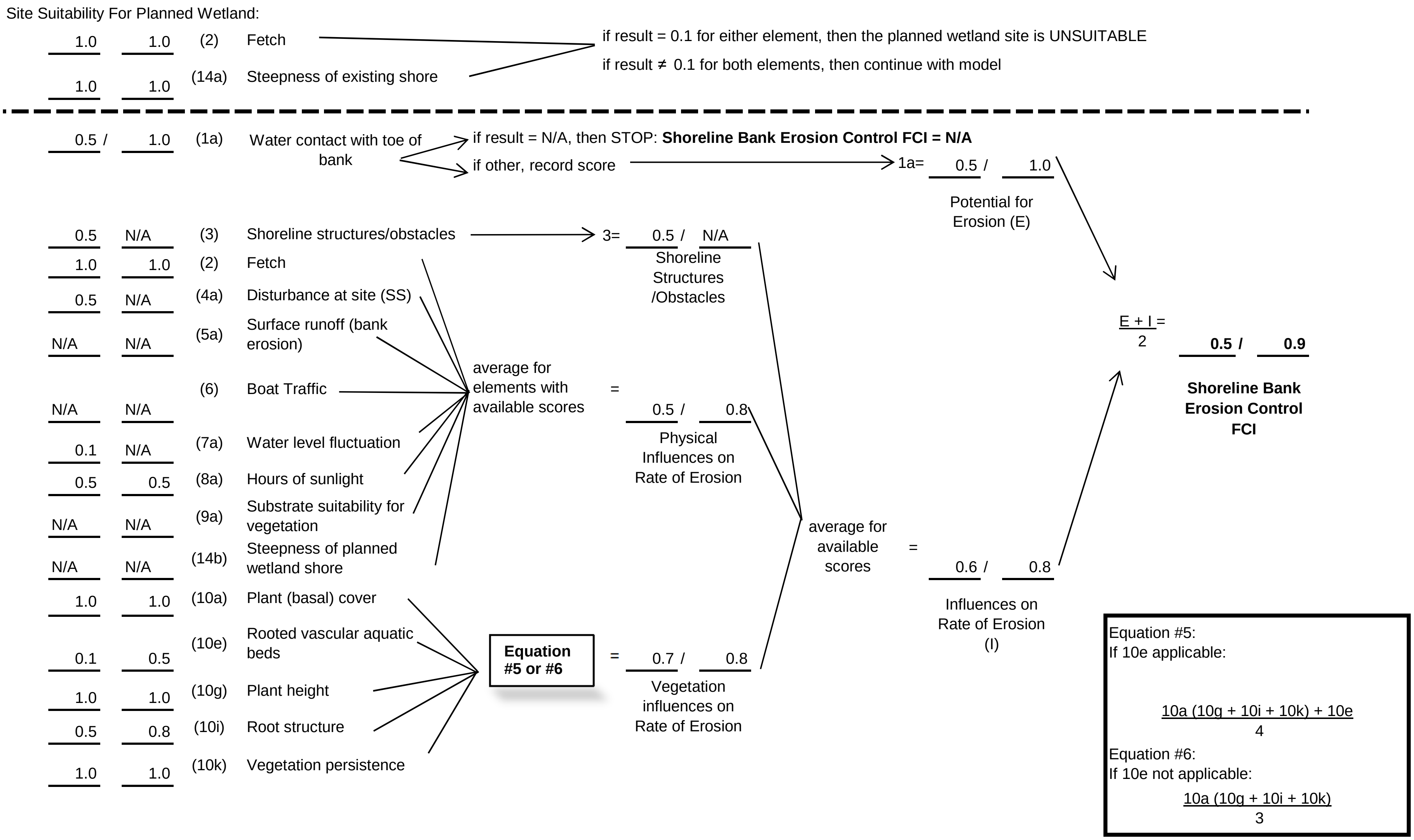
*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Shoreline Bank Erosion Control

Selected Scores (#) Element

Comparison:____ (e.g., WAA/planned wetland)



Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0

Potential for Erosion (E)

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
0.1 /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c) = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Water Quality

Selected Scores	(#)	Element
		Comparison:________________ / ________________ (e.g., WAA/planned wetland)
0.1 / 0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.5 / N/A	(4b)	Disturbance at site (WQ)
0.1 / 0.1	(7a)	Water level fluctuation
0.1 / N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 1.0	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.4 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
0.8 / 0.8	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.6 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.3 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.2 / 0.5 Wetland Condition (C)

If LF = N/A

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.3	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.5 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.5 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.5 / 0.7
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.3
Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.5
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.2 / 0.4
Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ =

0.2 / 0.4
Wildlife FCI

`

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element	
N/A / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

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Selected Scores	(#)	Element		
0.1 / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.367 / N/A Limiting Factors
0.5 / N/A	(4a)	Disturbance at site (SS)		
0.5 / N/A	(4d)	Disturbance in channel/open water		
N/A / N/A	(16c)	Fish habitat size		
N/A / N/A	(24)	Obstruction to fish passage		

Selected Scores	(#)	Element		
0.5 / 1.0	(10m)	Vegetative overhang	average for elements with available scores	= 0.4 / 0.6 Food/Cover
0.7 / 0.7	(10o)	Plant biomass		
0.5 / 0.5	(21b)	Shape of wetland/water edge		
0.3 / 0.3	(22b)	Available fish cover/attractors		
0.5 / 0.5	(25a)	% pool area		
0.1 / 0.5	(26)	Bank account		

Selected Scores	(#)	Element		
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction
0.5 0.5	(27a)	Spawning substrate		
N/A N/A	(27b)	Spawning structures		

Selected Scores	(#)	Element	
0.5 / 1.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

Selected Scores	(#)	Element		
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 1.5 Water Quality (WQ)
INA / INA	(20d)	Dissolved Oxygen		
INA / INA	(20e)	pH		
INA / INA	(20f)	Maximum water temperature		
INA / INA	(20g)	Turbidity		

average for available scores = **0.5 / 0.9**

Fish (Non-Tidal Stream/River)

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Uniqueness/Heritage

Selected Scores		(#)	Element
			Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:__________________________________ / __________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a~~ and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative B Year 20

Calculation of Wildlife (Upland)

Selected Scores		(#)	Element
			Comparison: ______________ / ______________ (e.g., WAA/planned wetland)
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

0.7	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8 Vegetation Strata

0.2	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.3 / 0.3**

If F = NA

Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative C Year 20

Comparison between WAA#_____________________ and wetland # _____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.73	3.87	2.808	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.47	3.87	1.815	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.41	3.87	1.588	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.24	3.87	0.933	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.86	3.87	3.335	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$$\frac{E + I}{2} =$$ **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
0.1 /	0.1	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.1 / 0.1
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.7
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.1 / 0.5**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1 - 10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 20

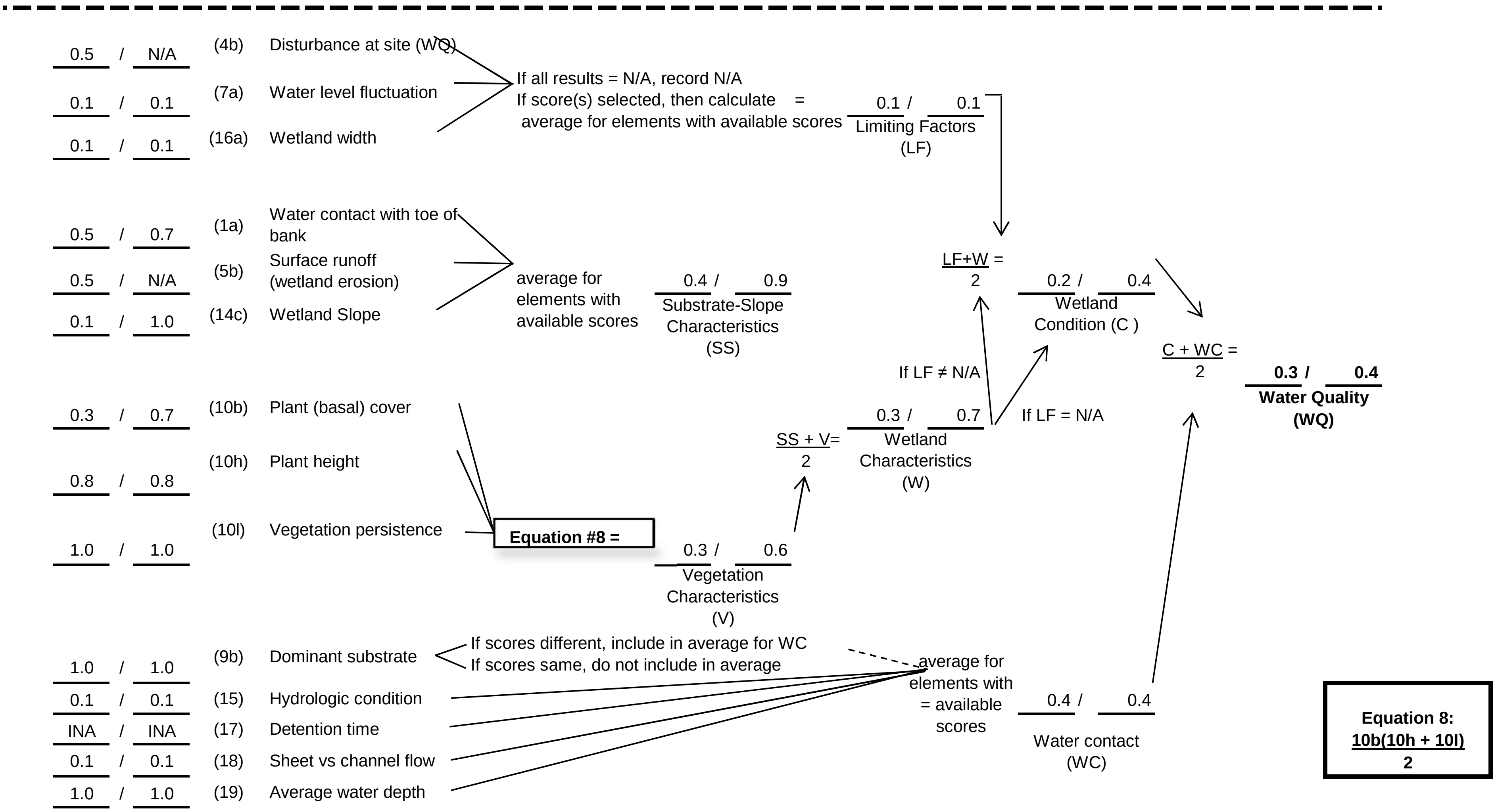
Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
0.1	0.1	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width
0.5	0.7	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope
0.3	0.7	(10b)	Plant (basal) cover
0.8	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

average for elements with available scores

0.4 / 0.9 Substrate-Slope Characteristics (SS)

Equation #8 =

0.3 / 0.6 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.3 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF + W}{2}$ =

If LF = N/A

0.2 / 0.4 Wetland Condition (C)

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.3 / 0.4 Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
N/A	1.0	(11c)	Spatial pattern of shrubs/trees
0.1	0.2	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
0.1	0.5	(13a)	% open water
0.1	0.5	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.5 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

`

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.1	N/A	(1b)	Shoreline bank stability
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5	1.0	(10m)	Vegetative overhang
0.7	0.7	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.5	0.5	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5	1.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 1.5 Water Quality (WQ)

average for available scores = **0.5 / 0.9**

Fish (Non-Tidal Stream/River)

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$\frac{10a\ (\cancel{10g +} 10i + 10k)}{\cancel{3}2}$

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Sediment Stabilization (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a~~ and 7a~~ = N/A, record N/A if not, then record ~~lowest~~ score from 4a ~~or 7a~~ = 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 20

Calculation of Wildlife (Upland)

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3 Wildlife FCI**

If F = NA: HC → **Wildlife FCI**

EPW Summary Sheets
50 Year

River Park/West Farm Rapids Park

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.66	0.00	0.002	0.69	1	0.0020	0.69	0.0029	0.70	0.33	0.230	Y
SS	0.51	0.00	0.002	0.53	1	0.0015	0.53	0.0029	0.67	0.33	0.219	Y
WQ	0.40	0.00	0.001	0.40	1	0.0012	0.40	0.0030	0.46	0.33	0.153	Y
WL	0.11	0.00	0.000	0.15	1	0.0003	0.15	0.0022	0.18	0.33	0.058	Y
FS	0.26	0.00	0.001	0.40	1	0.0008	0.40	0.0019	0.53	0.33	0.175	Y
UH	1.00	■	■	1.00	■	■	■	■	1.00	■	■	Y

*FCUs	=	FCU x AREA
**Target FCI	=	*goal* established by decision makers
R	=	multiplying factor established by decision makers
Target FCUs	=	FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI	=	FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area	=	Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(8a)	Hours of sunlight
0.1	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.1	1.0	(10g)	Plant height
0.1	0.8	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

Shoreline structures/obstacles → 3= 0.5 / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.4 / 0.6

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.3 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.7 /** **0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

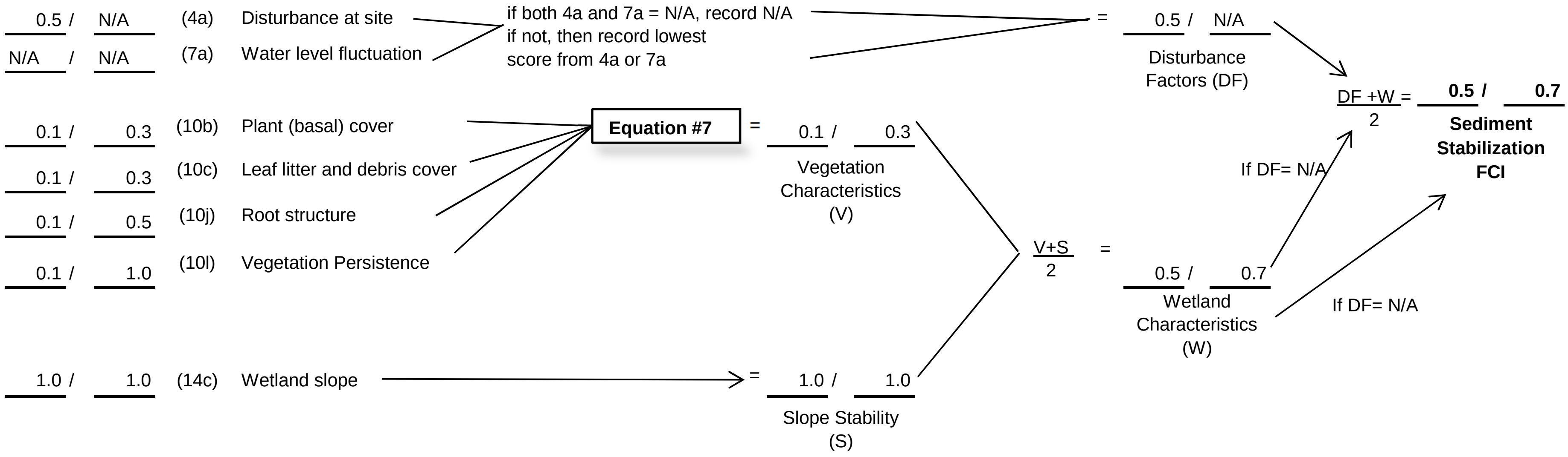
$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Sediment Stabilization

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)



0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.3 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.1	1.0	(10h)	Plant height
0.1	1.0	(10l)	Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.4 Wetland Condition (C)

If LF = N/A: Wetland Condition (C)

Selected Scores		(#)	Element
0.1	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

(9b): If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.5 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.3 / 0.7	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

Selected Scores	(#)	Element
N/A / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.1 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
0.1 /	0.5	(4d)	Disturbance in channel/open water
0.1 /	N/A	(16c)	Fish habitat size
N/A /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.233 / 0.5 Limiting Factors

Selected Scores		(#)	Element
N/A /	0.5	(10m)	Vegetative overhang
0.1 /	0.3	(10o)	Plant biomass
0.1 /	0.5	(21b)	Shape of wetland/water edge
0.1 /	0.3	(22b)	Available fish cover/attractors
0.1 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.1 / 0.4 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.3 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
0.1	0.1	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.3

Physical Influences on Rate of Erosion

Equation #6 = 0.2 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.3 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	0.1	(14c)	Wetland slope

4a, 7a: if ~~both~~ 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= N/A / N/A Disturbance Factors (DF)

10b, 10c, 10j, 10l: **Equation #7** = 0.3 / 0.3 Vegetation Characteristics (V)

14c: = 0.1 / 0.1 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.2 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.2**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative A Year 50

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees
0.1	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.2 / 0.2**
Wildlife FCI

If F = NA

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.66	0.00	0.002	0.69	1	0.0020	0.69	0.0029	0.69	0.33	0.228	Y
SS	0.51	0.00	0.002	0.53	1	0.0015	0.53	0.0029	0.67	0.33	0.219	Y
WQ	0.40	0.00	0.001	0.40	1	0.0012	0.40	0.0030	0.46	0.33	0.153	Y
WL	0.11	0.00	0.000	0.15	1	0.0003	0.15	0.0022	0.17	0.33	0.058	Y
FS	0.26	0.00	0.001	0.40	1	0.0008	0.40	0.0019	0.53	0.33	0.175	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(8a)	Hours of sunlight
0.1	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.1	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A
Shoreline Structures /Obstacles

average for elements with available scores = 0.4 / 0.6
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2
Vegetation influences on Rate of Erosion

average for available scores = 0.3 / 0.4
Influences on Rate of Erosion (I)

$\frac{E + I}{2} =$ **0.7 /** **0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores			(#)	Element
0.5	/	N/A	(4b)	Disturbance at site (WQ)
N/A	/	N/A	(7a)	Water level fluctuation
0.1	/	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.3 / 0.1 Limiting Factors (LF)

Selected Scores			(#)	Element
1.0	/	1.0	(1a)	Water contact with toe of bank
N/A	/	N/A	(5b)	Surface runoff (wetland erosion)
1.0	/	1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores			(#)	Element
0.1	/	0.3	(10b)	Plant (basal) cover
0.1	/	1.0	(10h)	Plant height
0.1	/	1.0	(10l)	Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.4 Wetland Condition (C)

If LF = N/A: 0.4 / 0.4 Wetland Condition (C)

Selected Scores			(#)	Element
0.1	/	1.0	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.1	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.5 Water Quality (WQ)**

Equation 8:
$$\frac{\mathbf{10b(10h + 10l)}}{\mathbf{2}}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.3 / 0.7	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
N/A / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.2 / 0.7
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.1 / 0.2
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.1 / 0.2**

If F = NA: **0.1 / 0.2**

Wildlife FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:__________________________ / __________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
N/A	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
0.1	/	0.5	(4d)	Disturbance in channel/open water
0.1	/	N/A	(16c)	Fish habitat size
N/A	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.233 / 0.5 Limiting Factors

Selected Scores			(#)	Element
N/A	/	0.5	(10m)	Vegetative overhang
0.1	/	0.3	(10o)	Plant biomass
0.1	/	0.5	(21b)	Shape of wetland/water edge
0.1	/	0.3	(22b)	Available fish cover/attractors
0.1	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.1 / 0.4 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.5	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
0.1	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.3 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Uniqueness/Heritage

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
0.1	0.1	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.3

Physical Influences on Rate of Erosion

Equation #6 = 0.2 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.3 /** **#####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +} 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.3	0.3	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	0.1	(14c)	Wetland slope

(4a), (7a): if ~~both~~ 4a ~~and 7a~~ = N/A, record N/A if not, then record ~~lowest~~ score from 4a ~~or 7a~~ = N/A / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.3 Vegetation Characteristics (V)

(14c): = 0.1 / 0.1 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.2 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2** / **0.2** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative B Year 50

Calculation of Wildlife (Upland)

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.7	0.7	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7 Vegetation Strata

Selected Scores		(#)	Element
0.1	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.35	0.92	0.325	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.77	0.92	0.708	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.41	0.92	0.374	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.25	0.92	0.227	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.39	0.92	0.357	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.5	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.5

Potential for Erosion (E)

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.3 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.2

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.4**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Sediment Stabilization

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation = 0.3 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Water Quality

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.1 / 0.1	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.5	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.8 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
0.1 / 0.1	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ)

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Wildlife

Selected Scores	(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
1.0 / 1.0	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.3
Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.4
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.2
Wildlife FCI

`

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5	0.5	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
1.0	1.0	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
INA	INA	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
0.1	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Uniqueness/Heritage

Selected Scores		(#)	Element
			Comparison:______ / ______ (e.g., WAA/planned wetland)
Site Suitability For Planned Wetland:			
N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.4**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **~~N/A~~ / ~~N/A~~**

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1 /	0.1	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.1 Disturbance Factors (DF)

Equat = 0.5 / 0.5 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.4 /** **0.4** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 860. River Park/West Farm Rapids Park Alternative C Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
1.0 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 0.1	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.5 / 1.0	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.9 / 0.5 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.7 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.6 / 0.6 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.4 / 0.6
Wildlife FCI

`

Bronx Zoo and Dam

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative A Year 50
Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.53	1.38	0.729	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.84	1.38	1.156	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.43	1.38	0.595	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.34	1.38	0.473	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.41	1.38	0.564	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

0.3	0.7	(10a)	Plant (basal) cover
0.5	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.3 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.4

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.5**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 50

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.3 / 0.7	(10b)	Plant (basal) cover
0.1 / 0.3	(10c)	Leaf litter and debris cover
0.5 / 0.8	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

4a, 7a: if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= N/A / N/A
Disturbance Factors (DF)

10b, 10c, 10j, 10l: **Equation** = 0.3 / 0.7
Vegetation Characteristics (V)

14c: = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

$\frac{DF + W}{2}$ = **0.6 / 0.8**
Sediment Stabilization FCI

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

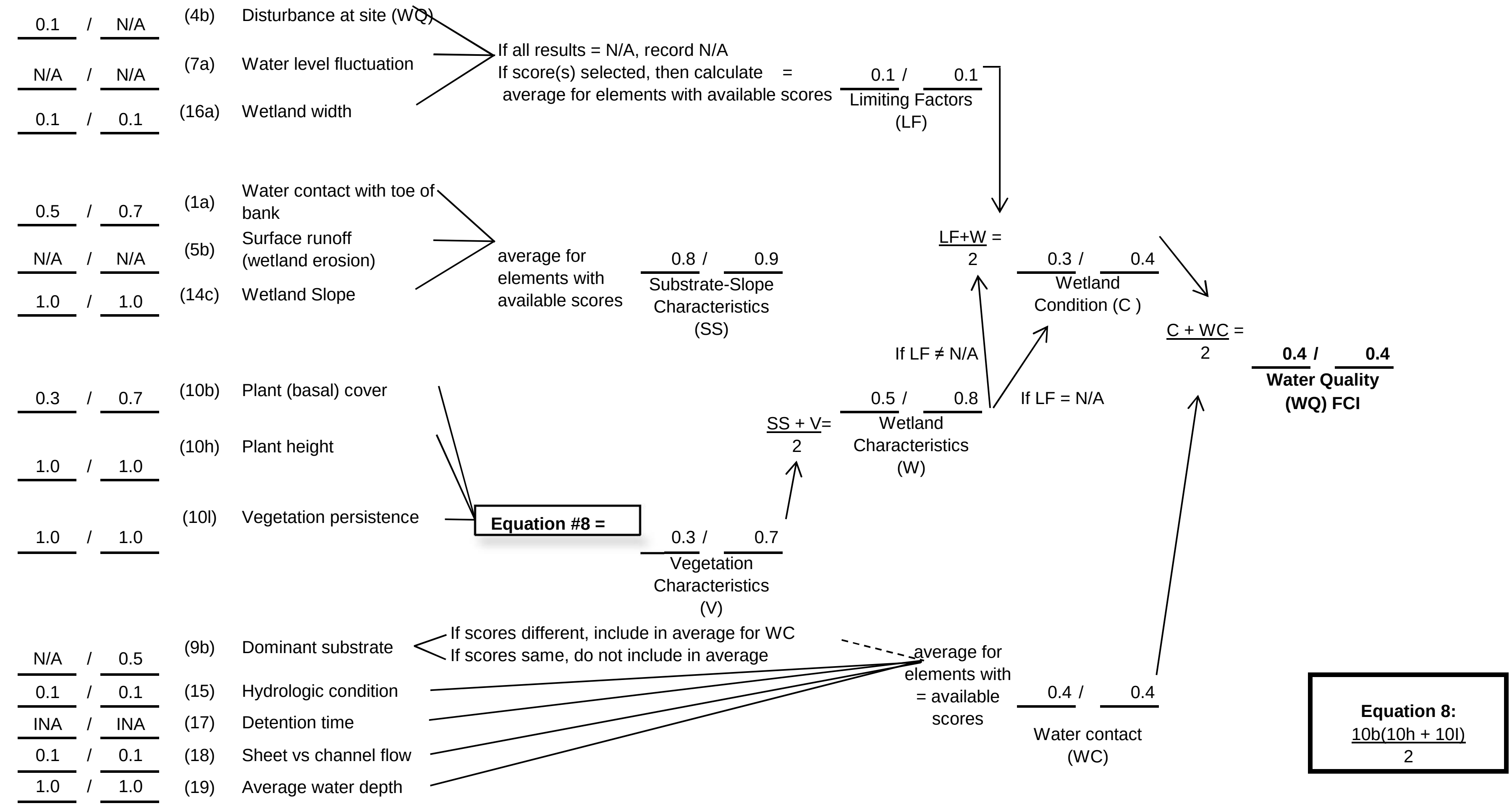
Project Title:Site 861. Bronx Zoo Alternative A Year 50

Calculation of Water Quality

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

0.1 / 0.1	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.



Selected Scores	(#)	Element
0.1 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A

If LF = N/A

$\frac{LF+W}{2}$ =

0.3 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
N/A / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ) FCI

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 50

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
N/A	/	N/A	(4c)	Disturbance of wildlife habitat
N/A	/	N/A	(20a)	Gross contamination
0.1	/	0.1	(16b)	Wetland size
1.0	/	1.0	(11a)	Layers
0.3	/	0.7	(11b)	Condition of Layers
N/A	/	N/A	(11c)	Spatial pattern of shrubs/trees
0.1	/	0.3	(12a)	Cover types
0.5	/	0.5	(12b)	Ratio of cover types
0.5	/	0.5	(12c)	Cover type interspersion
0.1	/	N/A	(12d)	Undesirable species
0.5	/	0.5	(13a)	% open water
0.1	/	0.5	(13b)	Vegetation/water interspersion
0.1	/	0.1	(21a)	Shape of upland/wetland edge
N/A	/	N/A	(22a)	Wildlife attractors
0.1	/	1.0	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.9 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.3 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.6 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.3**

If F = NA: HC =

Wildlife FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element	
0.5	0.5	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores		(#)	Element
0.5	N/A	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.8	(22b)	Available fish cover/attractors
1.0	1.0	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element	
INA	INA	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

Selected Scores		(#)	Element
0.1	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative A Year 50

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.2**

Influences on Rate of Erosion (I)

E + I = ~~**N/A**~~ / ~~**N/A**~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title:Site 861. Bronx Zoo Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores	(#)	Element
0.1 / 0.5	(4a)	Disturbance at site
~~N/A~~ / ~~N/A~~	(7a)	Water level fluctuation
0.3 / 0.3	(10b)	Plant (basal) cover
0.7 / 0.7	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.5
Disturbance Factors (DF)

Equat = 0.5 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.4 /** **0.6**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative A Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size
1.0	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	0.1	(11c)	Spatial pattern of shrubs/trees
0.1	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
1.0	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.9 / 0.5 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a)–(23): average for elements with available scores = 0.6 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.4 / 0.4
Wildlife FCI

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Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.52	1.11	0.572	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.84	1.11	0.930	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.43	1.11	0.479	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.26	1.11	0.287	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.41	1.11	0.453	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.3 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.3

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.5**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores			(#)	Element
N/A	/	N/A	(4a)	Disturbance at site
N/A	/	N/A	(7a)	Water level fluctuation
0.3	/	0.7	(10b)	Plant (basal) cover
0.1	/	0.3	(10c)	Leaf litter and debris cover
0.5	/	0.8	(10j)	Root structure
1.0	/	1.0	(10l)	Vegetation Persistence
1.0	/	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation = 0.3 / 0.7
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.1	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.3	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.4 Wetland Condition (C)

Selected Scores		(#)	Element
N/A	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ) FCI

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
1.0 / 1.0	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
0.1 / N/A	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.4
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.3
Wildlife FCI

`

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.3 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
1.0 /	1.0	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
INA /	INA	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.1 / 0.1 Water Quality (WQ)

average for available scores = **0.4 /** **0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Uniqueness/Heritage

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted] 1a= N/A / N/A

Potential for Erosion (E)

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.2**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.5	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.3	0.3	(10b)	Plant (basal) cover
0.7	0.7	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.1 / 0.5
Disturbance Factors (DF)

Equat = 0.5 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

$\frac{DF + W}{2}$ = **0.4 / 0.6**
Sediment Stabilization FCI

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative B Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
1.0 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 0.1	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

average for elements with available scores = 0.9 / 0.5 Vegetation Strata

average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

average for elements with available scores = 0.6 / 0.6 Physical Features

average for available scores = 0.6 / 0.5 Habitat Complexity (HC)

If F ≠ NA

If F = NA

$\frac{F + HC}{2}$ =

0.4 / 0.5
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.35	0.43	0.152	0.40	1	0.1518	0.40	0.3796	0.35	0.92	0.325	Y
SS	0.63	0.43	0.271	0.70	1	0.2709	0.70	0.3870	0.77	0.92	0.708	Y
WQ	0.36	0.43	0.153	0.37	1	0.1532	0.37	0.4140	0.42	0.92	0.385	Y
WL	0.22	0.43	0.095	0.25	1	0.0947	0.25	0.3788	0.25	0.92	0.231	Y
FS	0.37	0.43	0.159	0.40	1	0.1595	0.40	0.3986	0.39	0.92	0.357	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.1	0.1	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	0.5	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.5

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
0.1	0.1	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.5	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.1 / 0.1

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.3 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.2 / 0.2

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.4 /** **0.4**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

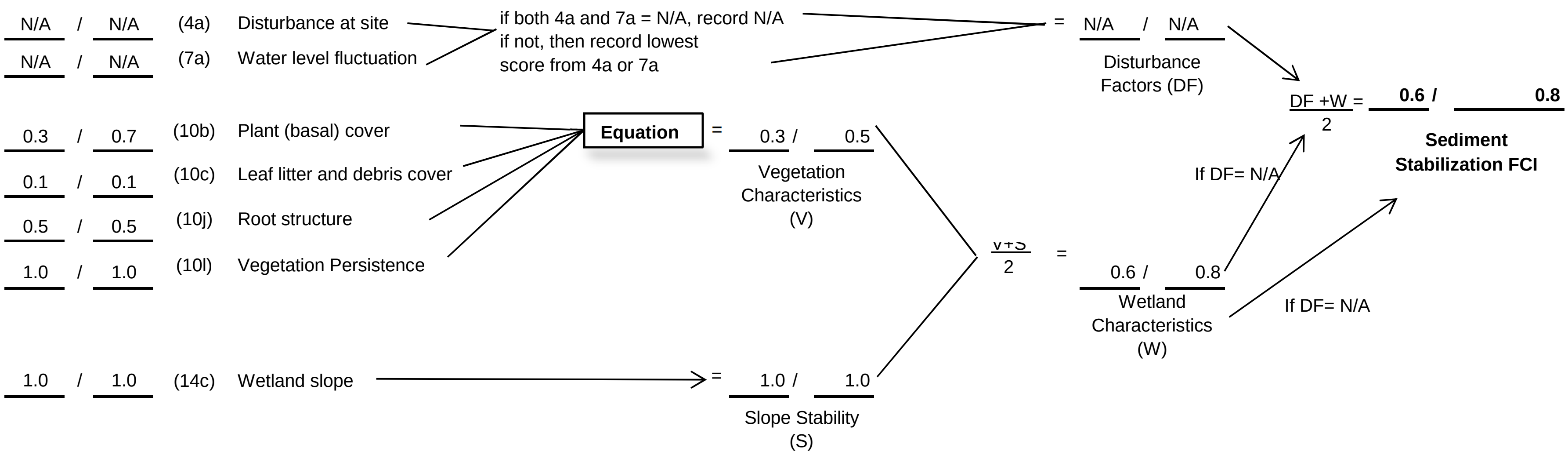
$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Sediment Stabilization

Selected Scores	(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)



Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.3 / 0.7	(10b)	Plant (basal) cover
0.1 / 0.1	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
1.0 / 1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation = 0.3 / 0.5
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

0.1 / 0.1	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.

0.1 / 0.1	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1
Limiting Factors (LF)

0.5 / 0.5	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores

0.8 / 0.8
Substrate-Slope Characteristics (SS)

0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.7
Vegetation Characteristics (V)

SS + V= / 2

0.5 / 0.7
Wetland Characteristics (W)

If LF ≠ N/A

LF+W = / 2

If LF = N/A

0.3 / 0.4
Wetland Condition (C)

C + WC = / 2

0.4 / 0.4
Water Quality (WQ) FCI

N/A / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4
Water contact (WC)

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Wildlife

Comparison:__________ / __________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
1.0 / 1.0	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.3 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.3

Wildlife FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element	
0.5 /	0.5	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores		(#)	Element		
0.5 /	0.5	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / 0.5 Limiting Factors
N/A /	N/A	(4a)	Disturbance at site (SS)		
N/A /	N/A	(4d)	Disturbance in channel/open water		
N/A /	N/A	(16c)	Fish habitat size		
0.5 /	0.5	(24)	Obstruction to fish passage		
0.1 /	0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.4 / 0.5 Food/Cover
0.3 /	0.3	(10o)	Plant biomass		
0.5 /	0.5	(21b)	Shape of wetland/water edge		
0.3 /	0.3	(22b)	Available fish cover/attractors		
1.0 /	1.0	(25a)	% pool area		
0.1 /	0.1	(26)	Bank account		
N/A /	N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction
0.5	0.5	(27a)	Spawning substrate		
N/A	N/A	(27b)	Spawning structures		
INA /	INA	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue	
0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.1 / 0.1 Water Quality (WQ)
INA /	INA	(20d)	Dissolved Oxygen		
INA /	INA	(20e)	pH		
INA /	INA	(20f)	Maximum water temperature		
INA /	INA	(20g)	Turbidity		

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:______________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = **0.4 / 0.4**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:
$\frac{10a\,(10g + 10i + 10k)}{3}$

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
0.3	0.3	(10b)	Plant (basal) cover
0.7	0.7	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A if not, then record ~~lowest~~ score from 4a ~~or 7a~~ = 0.1 / 0.1 Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equat** = 0.5 / 0.5 Vegetation Characteristics (V)

(14c) → = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.4 / 0.4** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 861. Bronx Zoo Alternative C Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
1.0	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	0.1	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.9 / 0.5
Vegetation Strata

Selected Scores		(#)	Element
0.1	0.1	(12a)	Cover types
0.5	1.0	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.7
Vegetation Cover Types

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
1.0	1.0	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.6
Physical Features

average for available scores = 0.6 / 0.6
Habitat Complexity (HC)

If F ≠ NA: (F + HC) / 2 =

If F = NA:

0.4 / 0.6
Wildlife FCI

Stone Mill Dam

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Comparison between WAA# and wetland # ____________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.39	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.58	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A if not, then record lowest score from 4a or 7a = N/A / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.1 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.6**

Sediment Stabilization FCI

Equation #7:

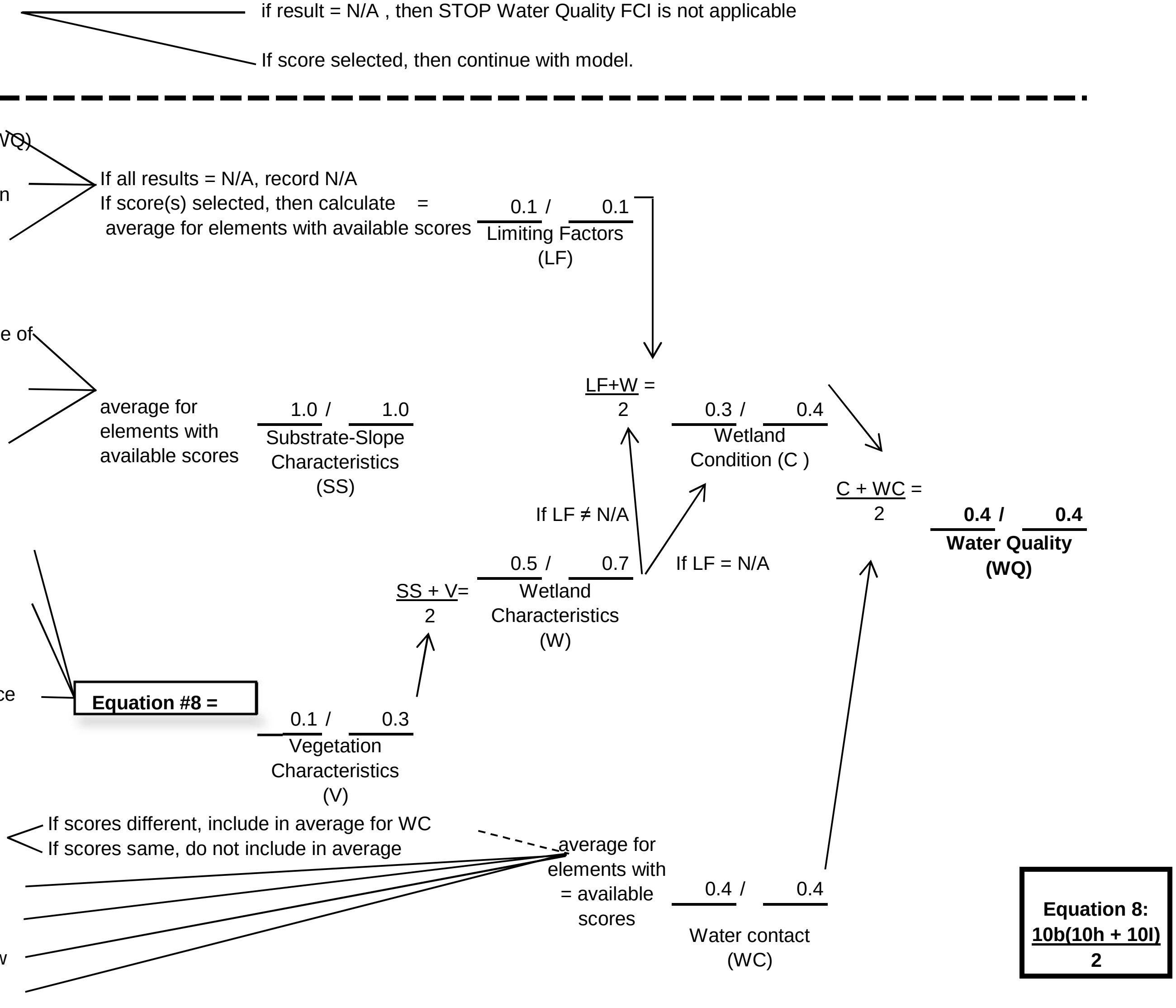
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Water Quality

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition
N/A / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width
1.0 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope
0.1 / 0.3	(10b)	Plant (basal) cover
0.5 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence
0.5 / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

If all results = N/A, record N/A
If score(s) selected, then calculate = 0.1 / 0.1
average for elements with available scores

Limiting Factors (LF)

average for elements with available scores 1.0 / 1.0
Substrate-Slope Characteristics (SS)

Equation #8 = 0.1 / 0.3
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ = 0.3 / 0.4
Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.4
Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.4**
Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.3 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.1 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.1
Wildlife FCI

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Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________________________ / _____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
0.5	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
N/A	/	N/A	(1b)	Shoreline bank stability
N/A	/	N/A	(4a)	Disturbance at site (SS)
N/A	/	N/A	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
0.5	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores			(#)	Element
0.1	/	0.1	(10m)	Vegetative overhang
1.0	/	1.0	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.8	(22b)	Available fish cover/attractors
0.5	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.5 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.5	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
#N/A	/	#N/A	(20f)	Maximum water temperature
#N/A	/	#N/A	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
1.0	1.0	(32)	Historical or archaeological significance
1.0	1.0	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
1.0	1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title:Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / ~~######~~

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 863. Stone Mill Dam Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.7 /	1.0	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a~~ and 7a~~ = N/A, record N/A
if not, then record~~ lowest~~
score from 4a~~ or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative B Year 50
Comparison between WAA# and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.38	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.61	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

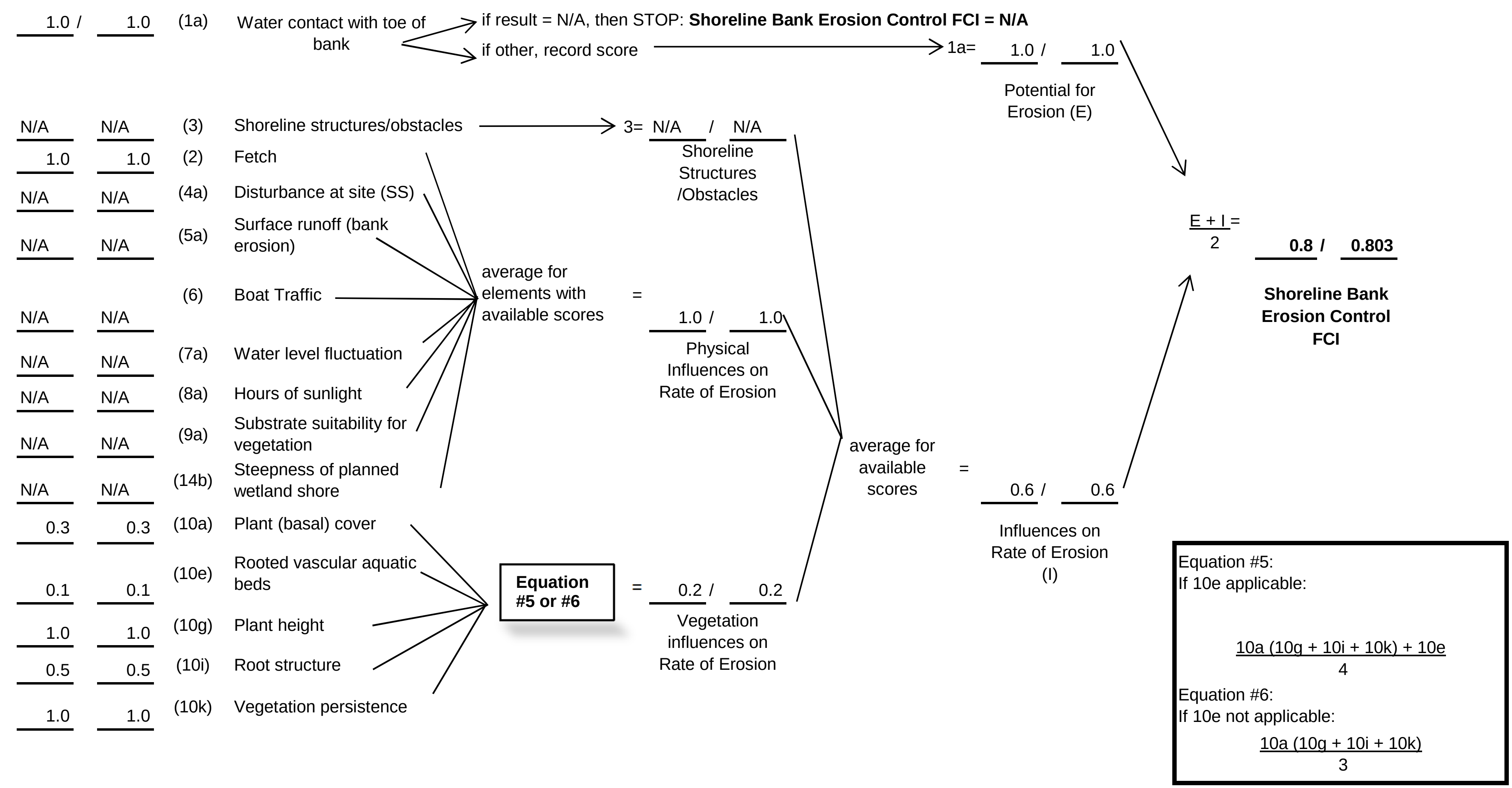
Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model



Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.1 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

N/A / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1
Limiting Factors (LF)

1.0 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores

1.0 / 1.0
Substrate-Slope Characteristics (SS)

0.1 / 0.3	(10b)	Plant (basal) cover
0.5 / 0.8	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 =

0.1 / 0.3
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.6
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.4
Wetland Condition (C)

0.5 / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4
Water contact (WC)

$\frac{C + WC}{2}$ =

0.4 / 0.4
Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.5 / 0.5	(11a)	Layers
0.1 / 0.1	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.3 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.1 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.1
Wildlife FCI

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Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________________________ / _____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A	N/A	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
1.0	1.0	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.8	(22b)	Available fish cover/attractors
0.5	0.5	(25a)	% pool area
0.1	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.2	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
#N/A	#N/A	(20f)	Maximum water temperature
#N/A	#N/A	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6** **Fish (Non-Tidal Stream/River)**

Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Uniqueness/Heritage

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
1.0 / 1.0	(32)	Historical or archaeological significance
1.0 / 1.0	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
1.0 / 1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 863. Stone Mill Dam Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.7 /	1.0	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Comparison between WAA# and wetland # ____________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.80	0.00	0.000	0.80	1	0.0000	0.80	0.0000	0.80	0.00	0.000	Y
SS	0.56	0.00	0.000	0.56	1	0.0000	0.56	0.0000	0.56	0.00	0.000	Y
WQ	0.36	0.00	0.000	0.40	1	0.0000	0.40	0.0000	0.46	0.00	0.000	Y
WL	0.12	0.00	0.000	0.12	1	0.0000	0.12	0.0000	0.12	0.00	0.000	Y
FS	0.40	0.00	0.000	0.50	1	0.0000	0.50	0.0000	0.58	0.00	0.000	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.3	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.6

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.8 / 0.803**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Sediment Stabilization

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.1	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.1 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.6 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.6 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title:Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Water Quality

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
N/A	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate = 0.1 / 0.1
average for elements with available scores

Limiting Factors (LF)

Selected Scores		(#)	Element
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores

1.0 / 1.0
Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 =

0.1 / 0.3
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.5 / 0.6
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.3 / 0.4
Wetland Condition (C)

$\frac{C + WC}{2}$ =

0.4 / 0.5
Water Quality (WQ)

Selected Scores		(#)	Element
0.5	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.6
Water contact (WC)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Wildlife

Selected Scores		(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1
Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.5	0.5	(11a)	Layers
0.1	0.1	(11b)	Condition of Layers
N/A	N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.3 / 0.3
Vegetation Strata

Selected Scores		(#)	Element
0.1	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.1	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

Selected Scores		(#)	Element
0.1	0.1	(13a)	% open water
0.1	0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1
Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.1 / 0.1
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.1
Wildlife FCI

`

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________________________ / _____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 / 0.5	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

N/A / N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.5 / 0.5 Limiting Factors
N/A / N/A	(4a)	Disturbance at site (SS)		
N/A / N/A	(4d)	Disturbance in channel/open water		
N/A / N/A	(16c)	Fish habitat size		
0.5 / 0.5	(24)	Obstruction to fish passage		

0.1 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.4 / 0.6 Food/Cover
1.0 / 1.0	(10o)	Plant biomass		
0.5 / 0.5	(21b)	Shape of wetland/water edge		
0.3 / 0.8	(22b)	Available fish cover/attractors		
0.5 / 0.5	(25a)	% pool area		
0.1 / 0.1	(26)	Bank account		

N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.2 / 0.8 Reproduction
0.2 / 0.5	(27a)	Spawning substrate		
N/A / 1.0	(27b)	Spawning structures		

0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)
INA / INA	(20d)	Dissolved Oxygen		
INA / INA	(20e)	pH		
#N/A / #N/A	(20f)	Maximum water temperature		
#N/A / #N/A	(20g)	Turbidity		

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Uniqueness/Heritage

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
1.0	1.0	(32)	Historical or archaeological significance
1.0	1.0	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
1.0	1.0	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
			Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Influences on Rate of Erosion (I)

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

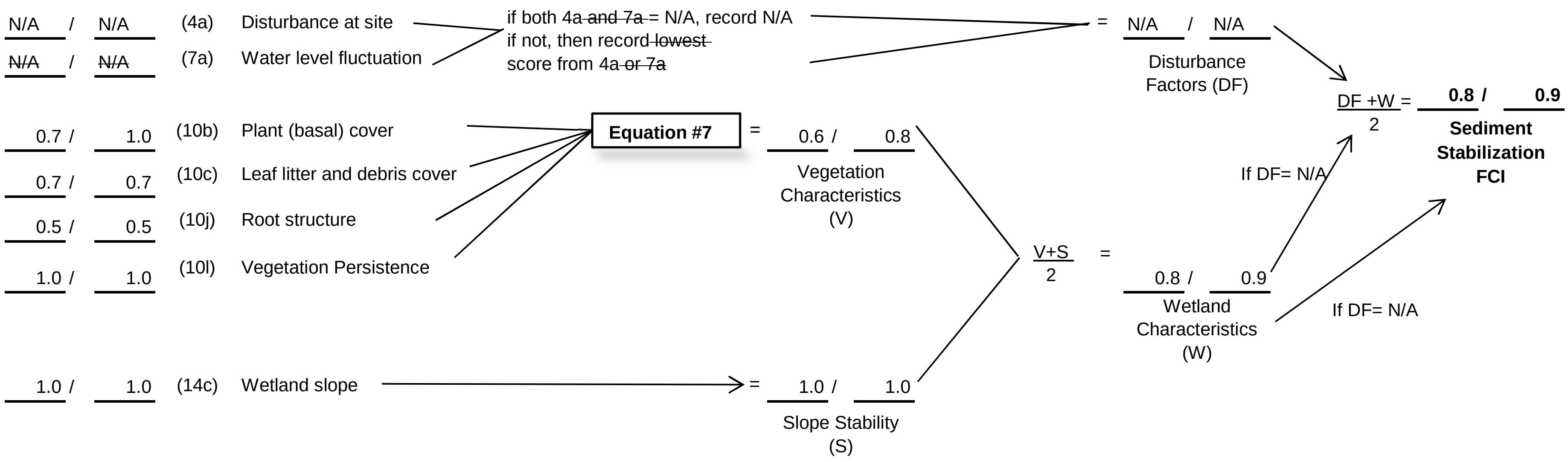
$$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 863. Stone Mill Dam Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)



N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.7 /	1.0	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.6 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.8 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.8 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Shoelace Park

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative A Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.5	1	0.0064	0.5	0.01275	0.71	2.84	2.024	
SS	0.16	0.02	0.003	0.3	1	0.0032	0.3	0.010583	0.86	2.84	2.435	
WQ	0.28	0.02	0.006	0.4	1	0.0056	0.4	0.014115	0.40	2.84	1.127	
WL	0.15	0.02	0.003	0.2	1	0.003	0.2	0.014919	0.22	2.84	0.637	
FS	0.35	0.02	0.007	0.5	1	0.007	0.5	0.014	0.46	2.84	1.294	
UH	1.00			1					1.00			

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.1 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.7 Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

3= N/A / N/A Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.5 / 0.8 Physical Influences on Rate of Erosion

0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.6 / 0.7 Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.3 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
0.1	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
1.0	1.0	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a = 0.1 / N/A Disturbance Factors (DF)

Equation #7 = 0.3 / 0.7 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Water Quality

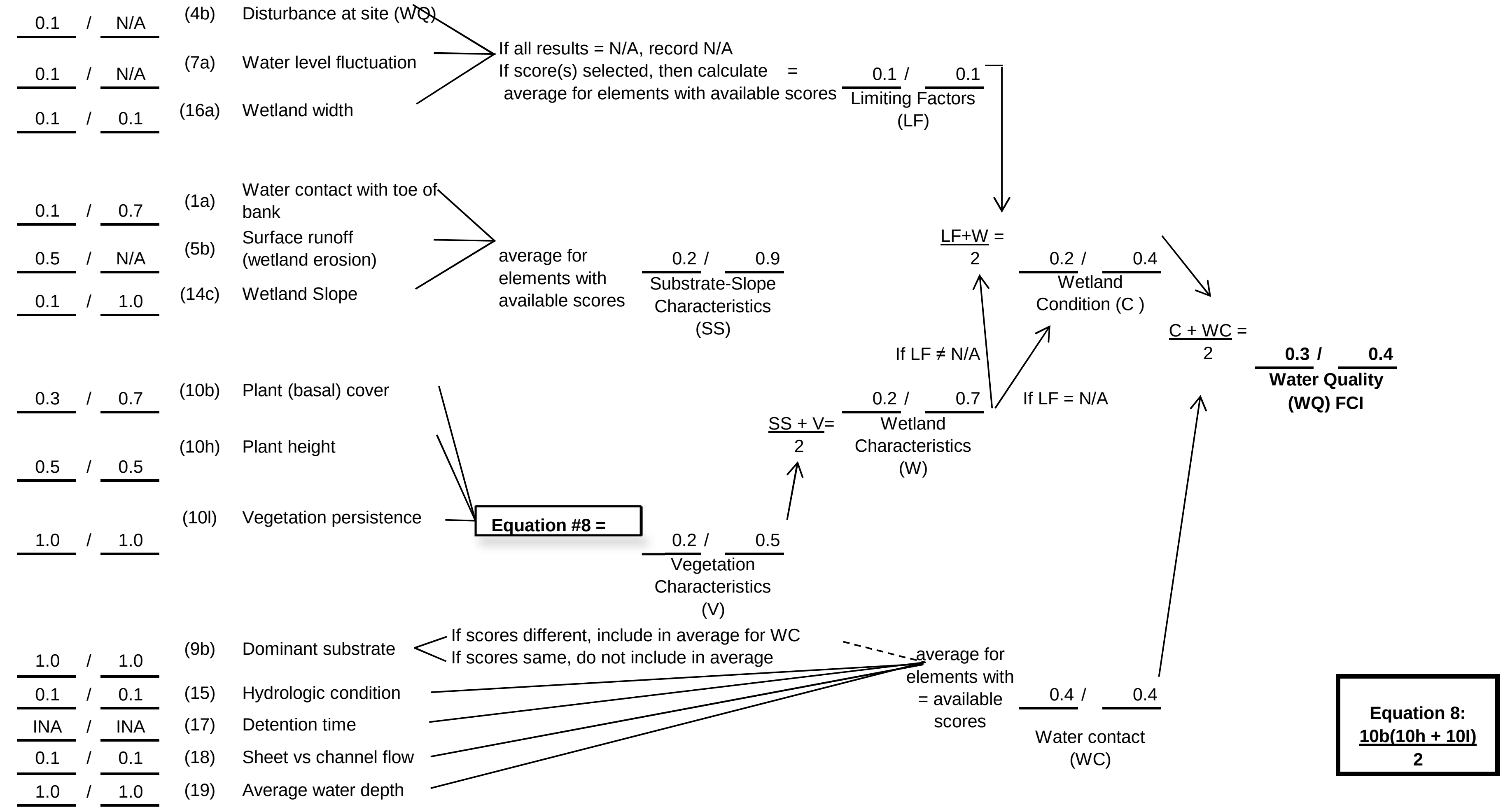
Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



0.1	N/A	(4b)	Disturbance at site (WQ)
0.1	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width
0.1	0.7	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope
0.3	0.7	(10b)	Plant (basal) cover
0.5	0.5	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If all results = N/A, record N/A
If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

average for elements with available scores

0.2 / 0.9 Substrate-Slope Characteristics (SS)

Equation #8 =

0.2 / 0.5 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.2 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.2 / 0.4 Wetland Condition (C)

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ =

0.3 / 0.4
Water Quality (WQ) FCI

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title:Site 113. Shoelace Park Alternative A Year 50

Calculation of Wildlife

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element		
N/A / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / 0.1 Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination		
0.1 / 0.1	(16b)	Wetland size		
0.5 / 0.5	(11a)	Layers	average for elements with available scores	= 0.3 / 0.6 Vegetation Strata
0.1 / 0.7	(11b)	Condition of Layers		
N/A / N/A	(11c)	Spatial pattern of shrubs/trees		
0.1 / 0.1	(12a)	Cover types	average for elements with available scores	= 0.1 / 0.2 Vegetation Cover Types
0.1 / 0.1	(12b)	Ratio of cover types		
0.1 / 0.5	(12c)	Cover type interspersion		
0.1 / 0.1	(12d)	Undesirable species		
0.5 / 0.5	(13a)	% open water	average for elements with available scores	= 0.3 / 0.5 Vegetation/ Water Proportions
0.1 / 0.5	(13b)	Vegetation/water interspersion		
0.1 / 0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.1 / 0.1 Physical Features
N/A / N/A	(22a)	Wildlife attractors		
0.1 / 0.1	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.1 / 0.2**

If F = NA: HC = **0.1 / 0.2**

Wildlife FCI

`

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element	Comparison: ______ / ______ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element				
0.1	N/A	(1b)	Shoreline bank stability	average for elements with available scores	= 0.1 / N/A	Limiting Factors	average for available scores = **0.4 / 0.5**
0.1	N/A	(4a)	Disturbance at site (SS)				**Fish (Non-Tidal Stream/River) FCI**
N/A	N/A	(4d)	Disturbance in channel/open water				
N/A	N/A	(16c)	Fish habitat size				
N/A	N/A	(24)	Obstruction to fish passage				
0.5	0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.4	Food/Cover	
0.3	0.3	(10o)	Plant biomass				
0.5	0.5	(21b)	Shape of wetland/water edge				
0.3	0.3	(22b)	Available fish cover/attractors				
0.1	0.1	(25a)	% pool area				
0.1	0.5	(26)	Bank account				
N/A	N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5	Reproduction	
0.5	0.5	(27a)	Spawning substrate				
N/A	N/A	(27b)	Spawning structures				
0.5	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue			
INA	INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5	Water Quality (WQ)	
INA	INA	(20d)	Dissolved Oxygen				
INA	INA	(20e)	pH				
INA	INA	(20f)	Maximum water temperature				
INA	INA	(20g)	Turbidity				

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison:____________________________ / ____________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**
Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison:__________________ / __________________ (e.g., WAA/planned wetland)			
0.1	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a~~-or 7a~~

= 0.1 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.3 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative A Year 50

Calculation of Wildlife Upland

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

4c, 20a, 16b: If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

11a, 11b, 11c: average for elements with available scores = 0.7 / 0.7 Vegetation Strata

12a, 12b, 12c, 12d: average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

13a, 13b: average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

21a, 22a, 23: average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = 0.2 / 0.2 **Wildlife FCI**

If F = NA: **Wildlife FCI**

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Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative B Year 50

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.40	1	0.0064	0.60	0.0106	0.71	0.41	0.292	Y
SS	0.16	0.02	0.003	0.30	1	0.0032	0.50	0.0064	0.86	0.41	0.352	Y
WQ	0.28	0.02	0.006	0.40	1	0.0056	0.40	0.0141	0.40	0.41	0.163	Y
WL	0.15	0.02	0.003	0.20	1	0.0030	0.20	0.0149	0.22	0.41	0.092	Y
FS	0.35	0.02	0.007	0.40	1	0.0070	0.40	0.0175	0.46	0.41	0.187	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.1 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.6 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7

Influences on Rate of Erosion (I)

$$\frac{E + I}{2} =$$ **0.3 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative B Year 50

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
0.1	N/A	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
1.0	1.0	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A if not, then record lowest score from 4a or 7a = 0.1 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.2 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 50

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.1 / N/A	(4b)	Disturbance at site (WQ)
0.1 / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.1 / 0.7	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.2 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.3 / 0.7	(10b)	Plant (basal) cover
0.5 / 0.5	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.2 / 0.5 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.2 / 0.4 Wetland Condition (C)

If LF = N/A: 0.2 / 0.4 Wetland Condition (C)

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 113. Shoelace Park Alternative B Year 50

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.5 / 0.5	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.3 / 0.6 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.5 Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 113. Shoelace Park Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element	
N/A	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

---

Selected Scores		(#)	Element
0.1	N/A	(1b)	Shoreline bank stability
0.1	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.1 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.1	0.1	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.3 / 0.4 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element	
0.5	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River) FCI

Project Title: Site 113. Shoelace Park Alternative B Year 50

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 113. Shoelace Park

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.1	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4~~a or 7a~~

= 0.1 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.3 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 113. Shoelace Park

Calculation of Wildlife Upland

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 113. Shoelace Park Alternative C Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.32	0.02	0.006	0.5	1	0.0064	0.5	0.01275	0.61	0.39	0.239	Y
SS	0.16	0.02	0.003	0.3	1	0.0032	0.3	0.010583	0.48	0.39	0.187	Y
WQ	0.28	0.02	0.006	0.4	1	0.0056	0.4	0.014115	0.33	0.39	0.128	Y
WL	0.15	0.02	0.003	0.2	1	0.003	0.2	0.014919	0.22	0.39	0.087	Y
FS	0.35	0.02	0.007	0.5	1	0.007	0.5	0.014	0.47	0.39	0.182	Y
UH	1.00			1					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.1 /	0.5	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.1	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
1.0	1.0	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.1 / 0.5 Potential for Erosion (E)

(3) → 3= N/A / N/A Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.5 / 0.8 Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.6 / 0.7 Vegetation influences on Rate of Erosion

average for available scores = 0.5 / 0.7 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.3 / 0.6**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.5	(4a)	Disturbance at site
0.1	0.1	(7a)	Water level fluctuation
0.3	0.7	(10b)	Plant (basal) cover
0.1	0.1	(10c)	Leaf litter and debris cover
1.0	1.0	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
0.1	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / 0.1 Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.9 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.2 / 0.5** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

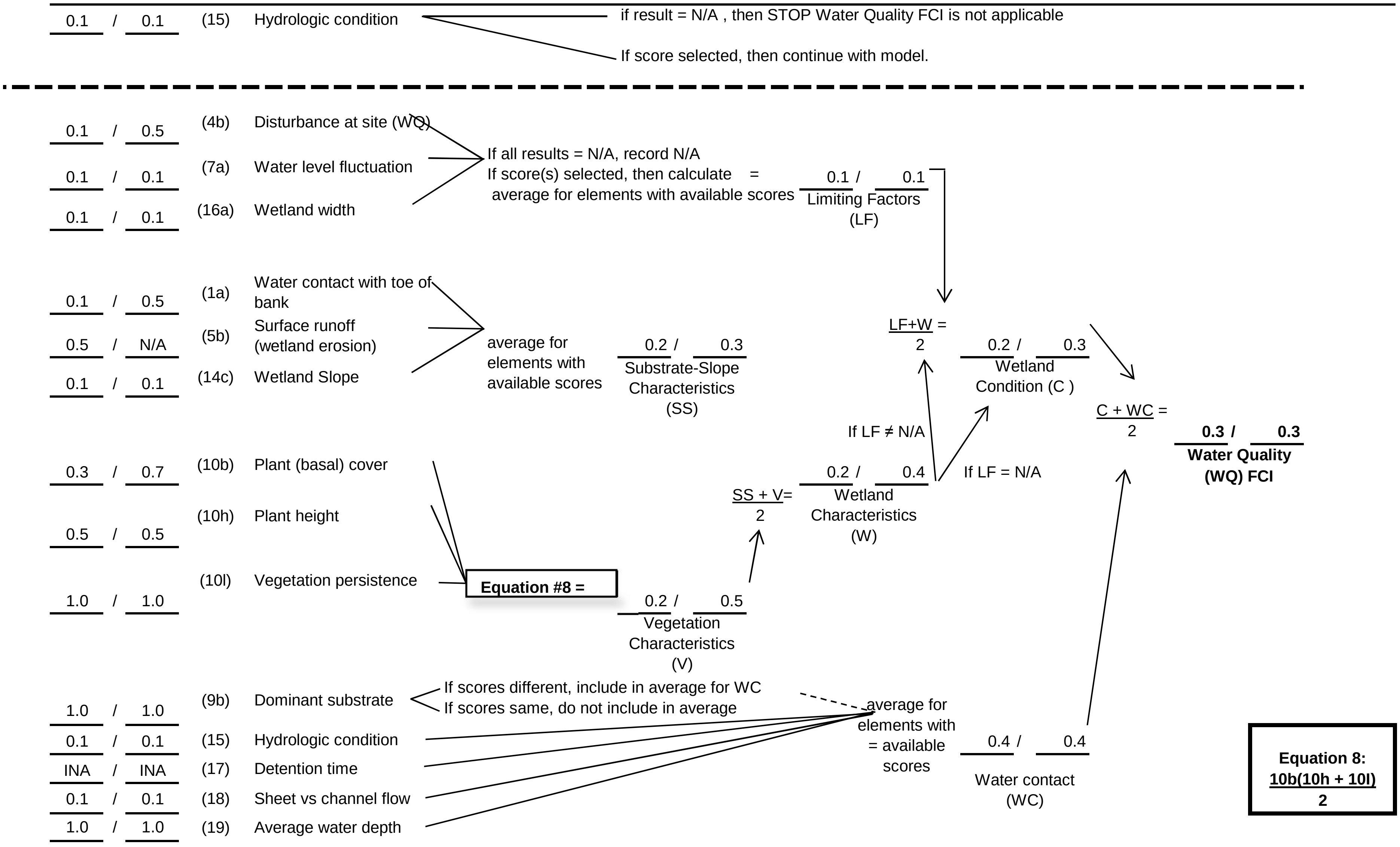
Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1\text{-}10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)



Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition
0.1 / 0.5	(4b)	Disturbance at site (WQ)
0.1 / 0.1	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width
0.1 / 0.5	(1a)	Water contact with toe of bank
0.5 / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 0.1	(14c)	Wetland Slope
0.3 / 0.7	(10b)	Plant (basal) cover
0.5 / 0.5	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

If all results = N/A, record N/A
If score(s) selected, then calculate = 0.1 / 0.1 Limiting Factors (LF)
average for elements with available scores

average for elements with available scores 0.2 / 0.3 Substrate-Slope Characteristics (SS)

Equation #8 = 0.2 / 0.5 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.4 Wetland Characteristics (W)

If LF ≠ N/A

If LF = N/A

$\frac{LF+W}{2}$ = 0.2 / 0.3 Wetland Condition (C)

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.3 Water Quality (WQ) FCI**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Wildlife

Comparison:_____________________________ / _____________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element		
N/A / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / 0.1 Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination		
0.1 / 0.1	(16b)	Wetland size		
0.5 / 0.5	(11a)	Layers	average for elements with available scores	= 0.3 / 0.6 Vegetation Strata
0.1 / 0.7	(11b)	Condition of Layers		
N/A / N/A	(11c)	Spatial pattern of shrubs/trees		
0.1 / 0.1	(12a)	Cover types	average for elements with available scores	= 0.1 / 0.2 Vegetation Cover Types
0.1 / 0.1	(12b)	Ratio of cover types		
0.1 / 0.5	(12c)	Cover type interspersion		
0.1 / 0.1	(12d)	Undesirable species		
0.5 / 0.5	(13a)	% open water	average for elements with available scores	= 0.3 / 0.5 Vegetation/ Water Proportions
0.1 / 0.5	(13b)	Vegetation/water interspersion		
0.1 / 0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.1 / 0.1 Physical Features
N/A / N/A	(22a)	Wildlife attractors		
0.1 / 0.1	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element	
N/A / N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

Selected Scores	(#)	Element			
0.1 / 0.5	(1b)	Shoreline bank stability	average for elements with available scores	= 0.1 / 0.5 Limiting Factors	
0.1 / N/A	(4a)	Disturbance at site (SS)			
N/A / N/A	(4d)	Disturbance in channel/open water			
N/A / N/A	(16c)	Fish habitat size			
N/A / N/A	(24)	Obstruction to fish passage			
0.5 / 0.5	(10m)	Vegetative overhang	average for elements with available scores	= 0.3 / 0.4 Food/Cover	average for available scores = **0.4 / 0.5** **Fish (Non-Tidal Stream/River) FCI**
0.3 / 0.3	(10o)	Plant biomass			
0.5 / 0.5	(21b)	Shape of wetland/water edge			
0.3 / 0.3	(22b)	Available fish cover/attractors			
0.1 / 0.1	(25a)	% pool area			
0.1 / 0.5	(26)	Bank account			
N/A / N/A	(25b)	Current velocity within pools	average for elements with available scores	= 0.5 / 0.5 Reproduction	
0.5 / 0.5	(27a)	Spawning substrate			
N/A / N/A	(27b)	Spawning structures			
0.5 / 0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue		
INA / INA	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	= 0.5 / 0.5 Water Quality (WQ)	
INA / INA	(20d)	Dissolved Oxygen			
INA / INA	(20e)	pH			
INA / INA	(20f)	Maximum water temperature			
INA / INA	(20g)	Turbidity			

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Uniqueness/Heritage

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0** / **1.0**

Uniqueness/ Heritage FCI

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.1	0.5	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.3 / 0.5
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.6**
Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4a)	Disturbance at site
~~N/A~~ / ~~N/A~~	(7a)	Water level fluctuation
1.0 / 1.0	(10b)	Plant (basal) cover
0.1 / 0.3	(10c)	Leaf litter and debris cover
0.5 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
0.1 / 1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.1 / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8
Vegetation Characteristics (V)

(14c): = 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.3** / **0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1\text{-}10b)}{2}$$

Project Title: Site 113. Shoelace Park Alternative C Year 50

Calculation of Wildlife Upland

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
0.1 / 0.1	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA: Habitat Complexity (HC) =

0.2 / 0.2
Wildlife FCI

`

Muskrat Cove

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.74	0.64	0.471	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.64	0.423	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.38	0.64	0.244	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.23	0.64	0.144	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.55	0.64	0.349	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Sediment Stabilization

Comparison:__________________ / __________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Water Quality

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores	(#)	Element
0.7 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.9 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.1 / 0.3	(10b)	Plant (basal) cover
0.5 / 1.0	(10h)	Plant height
0.1 / 0.8	(10l)	Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A

LF+W = / 2 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores	(#)	Element
0.5 / 0.5	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.1	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

C + WC = / 2 **0.3 / 0.4 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.3 / 0.7	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.0 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / 1.0	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.2 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.4 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.2
Wildlife FCI

Project Title:Site 862. Muskrat Cove Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
N/A	/	N/A	(1b)	Shoreline bank stability
N/A	/	N/A	(4a)	Disturbance at site (SS)
0.5	/	0.5	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
N/A	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores			(#)	Element
0.1	/	0.5	(10m)	Vegetative overhang
0.1	/	0.3	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.8	(22b)	Available fish cover/attractors
0.5	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.5 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.5		0.5	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

- - - - - - - - - - - - - - - - - - - -

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:

~~If 10e not applicable:~~

$$\frac{10a\ (\cancel{10g\ +}\ 10i + 10k)}{\cancel{3}2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison: ______ / ______ (e.g., WAA/planned wetland)			
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.3 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative A Year 50

Calculation of Wildlife (Upland)

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.74	0.64	0.471	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.64	0.423	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.46	0.64	0.291	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.19	0.64	0.120	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.55	0.64	0.349	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Sediment Stabilization

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A if not, then record lowest score from 4a or 7a = N/A / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.3 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.5 / 0.7** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

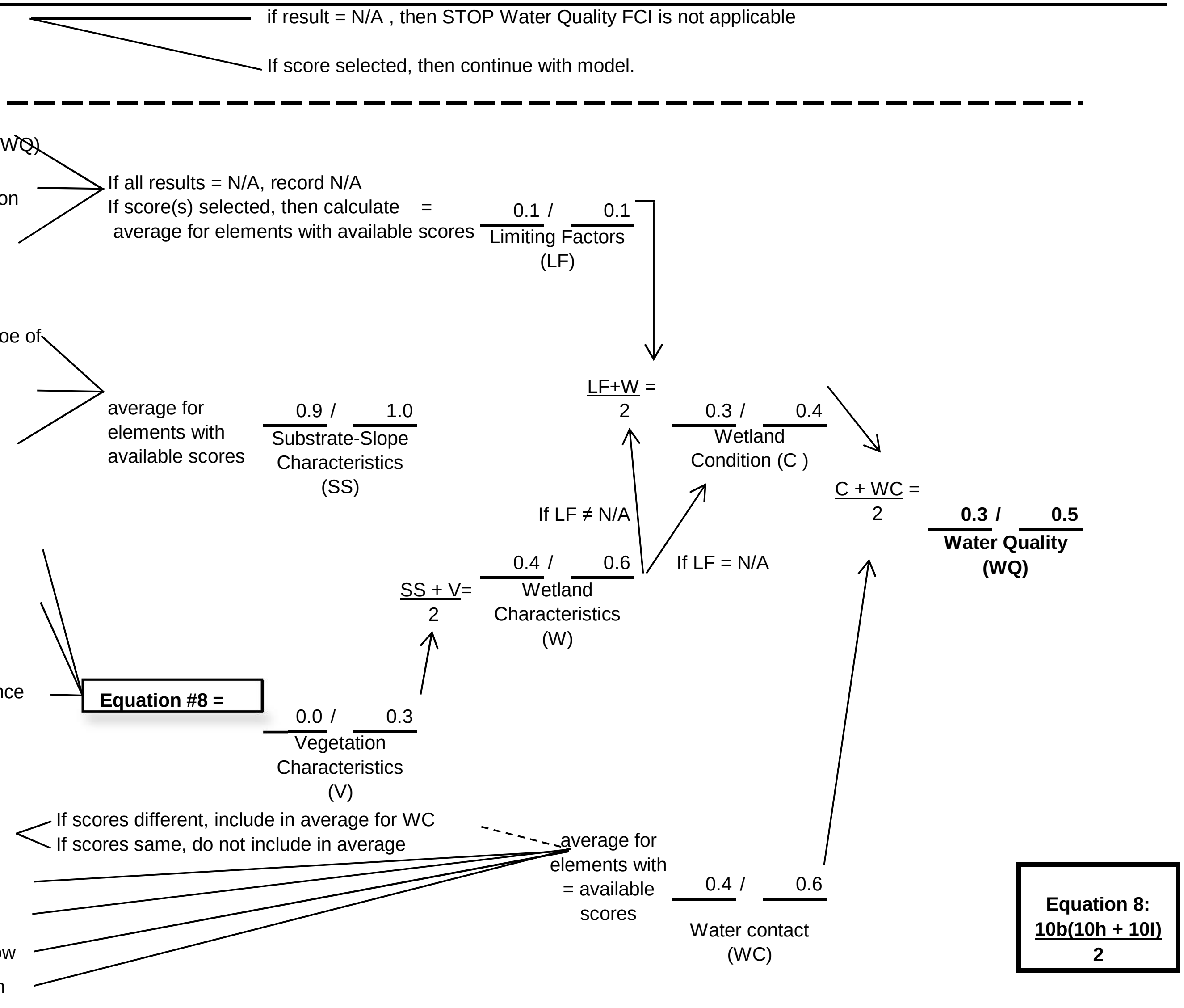
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(15)	Hydrologic condition
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width
0.7	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.1	0.3	(10b)	Plant (basal) cover
0.5	1.0	(10h)	Plant height
0.1	0.8	(10l)	Vegetation persistence
0.5	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth



(15) Hydrologic condition:

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

(4b), (7a), (16a):

If all results = N/A, record N/A

If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

(1a), (5b), (14c):

average for elements with available scores 0.9 / 1.0 Substrate-Slope Characteristics (SS)

(10b), (10h), (10l):

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A

If LF = N/A

$\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

(9b) Dominant substrate:

If scores different, include in average for WC

If scores same, do not include in average

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.5 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.3 / 0.7	(11a)	Layers
0.1 / 0.7	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.0 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.2 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.1 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
N/A /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
0.5 /	0.5	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
N/A /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.1 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.5 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.5 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Uniqueness/Heritage

Selected Scores		(#)	Element
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)
Site Suitability For Planned Wetland:			
N/A /	N/A	(29)	Endangered species
N/A /	N/A	(30)	Rarity
N/A /	N/A	(31)	Unique features
N/A /	N/A	(32)	Historical or archaeological significance
N/A /	N/A	(33)	Natural landmark
N/A /	N/A	(34)	Connected to Wild and Scenic River
1.0 /	1.0	(35)	Park, sanctuary, etc.
N/A /	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:

~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4a)	Disturbance at site
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
1.0	1.0	(10b)	Plant (basal) cover
0.3	0.3	(10c)	Leaf litter and debris cover
0.5	0.5	(10j)	Root structure
1.0	1.0	(10l)	Vegetation Persistence
1.0	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**
Sediment Stabilization FCI

Equation #7:

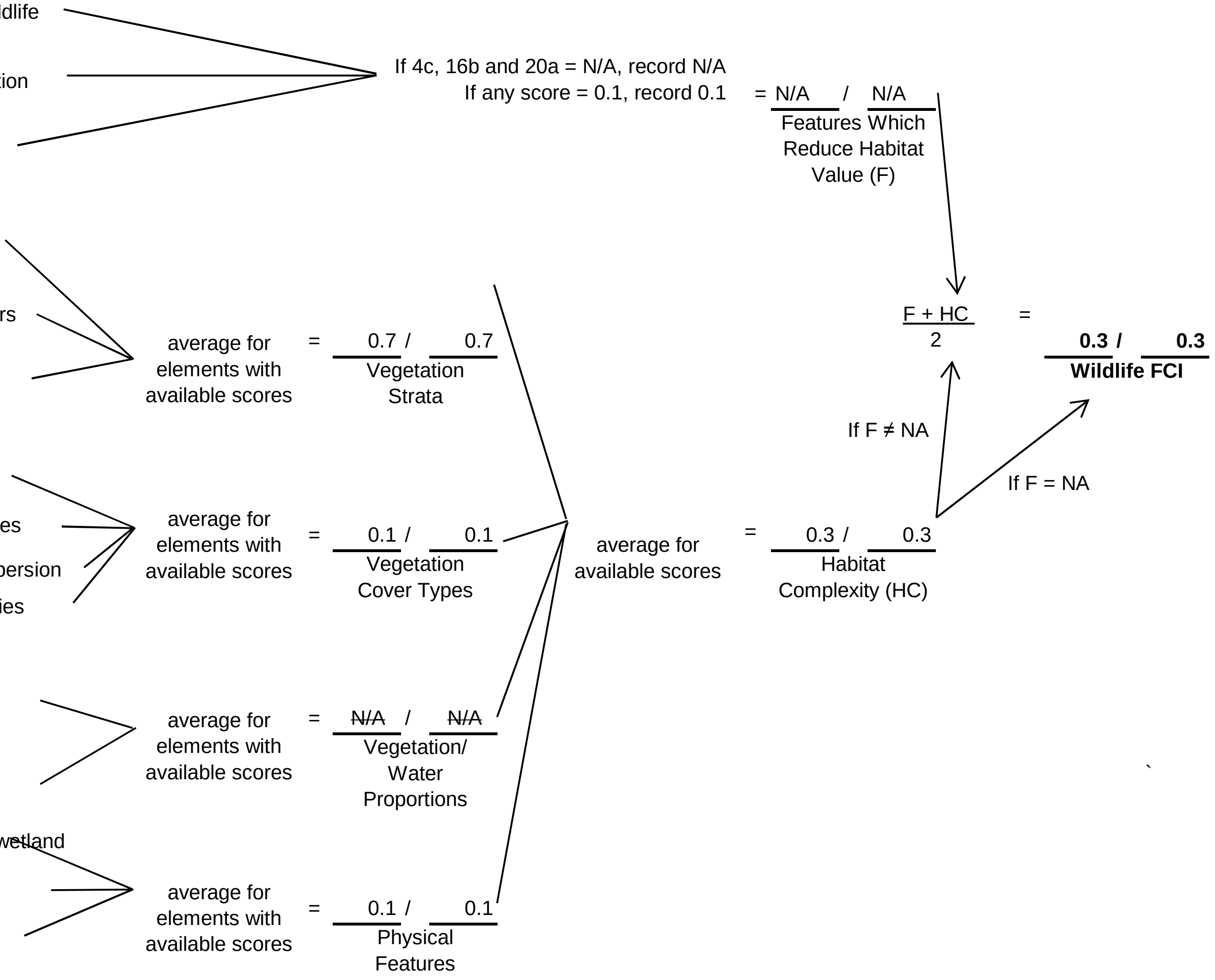
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative B Year 50

Calculation of Wildlife (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands



(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.7 / 0.7
Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a)–(23): average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.3 / 0.3
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.02	0.011	0.59	1	0.0110	0.59	0.0186	0.59	0.07	0.041	Y
SS	0.53	0.02	0.011	0.65	1	0.0106	0.65	0.0162	0.67	0.07	0.046	Y
WQ	0.34	0.02	0.007	0.38	1	0.0067	0.38	0.0176	0.37	0.07	0.025	Y
WL	0.11	0.02	0.002	0.15	1	0.0022	0.15	0.0147	0.19	0.07	0.013	Y
FS	0.44	0.02	0.009	0.45	1	0.0088	0.45	0.0196	0.45	0.07	0.031	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:__________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.1	(10e)	Rooted vascular aquatic beds
0.5	1.0	(10g)	Plant height
0.1	0.5	(10i)	Root structure
0.1	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.0 / 0.2

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.6**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

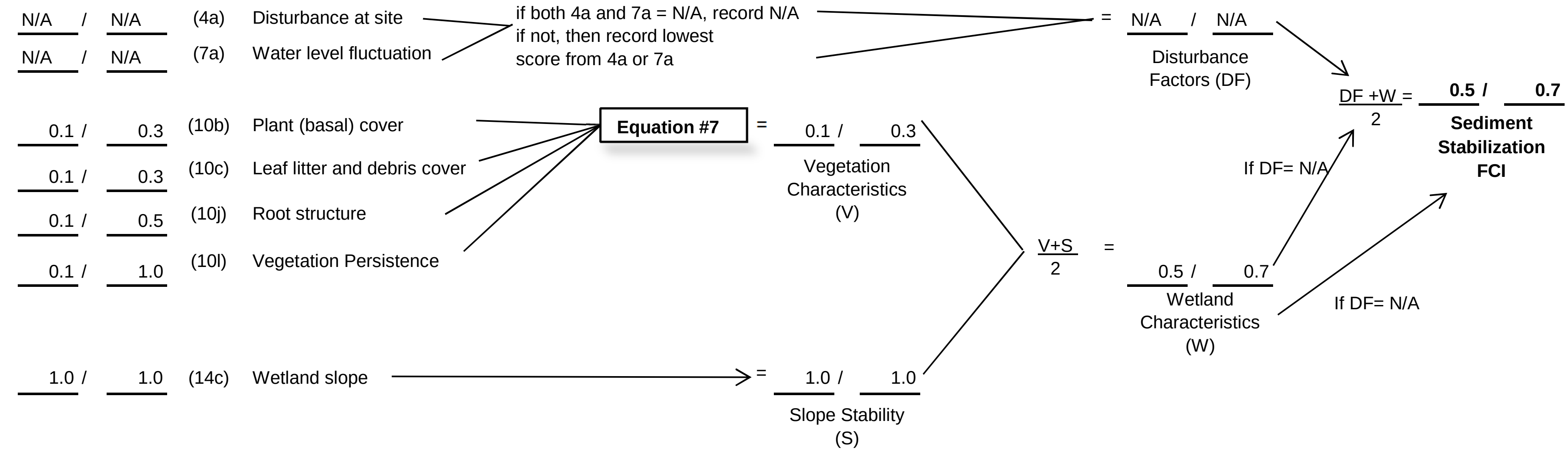
$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.1 /	0.5	(10j)	Root structure
0.1 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)



if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.5 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)
0.1	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 0.9 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
0.5	0.8	(10h)	Plant height
0.1	1.0	(10l)	Vegetation persistence

Equation #8 = 0.0 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 0.4 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 0.3 / 0.3 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
0.5	0.5	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.1	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.4 Water contact (WC)

C + WC = / 2 **0.3 / 0.4 Water Quality (WQ)**

Equation 8:
10b(10h + 10l)
2

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Wildlife

Comparison: ______ / ______ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	0.1	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.3	0.7	(11a)	Layers
0.1	0.7	(11b)	Condition of Layers
N/A	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.2 / 0.8 Vegetation Strata

Selected Scores		(#)	Element
0.0	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.1	0.1	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.1 Vegetation Cover Types

Selected Scores		(#)	Element
0.1	0.1	(13a)	% open water
0.1	0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.1 Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.1 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.1 / 0.2
Wildlife FCI

`

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
N/A	/	N/A	(1b)	Shoreline bank stability
N/A	/	N/A	(4a)	Disturbance at site (SS)
0.5	/	0.5	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
N/A	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores			(#)	Element
0.1	/	0.1	(10m)	Vegetative overhang
0.1	/	0.3	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.3	(22b)	Available fish cover/attractors
0.5	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.3 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.5		0.5	(27a)	Spawning substrate
N/A		N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Uniqueness/Heritage

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

[redacted]

1a= N/A / N/A

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.8 / 0.8**

Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k) / ~~3~~2

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison: ______ / ______ (e.g., WAA/planned wetland)			
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.3 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~ score from 4a ~~or 7a~~
= N/A / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.9 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 862. Muskrat Cove Alternative C Year 50

Calculation of Wildlife (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.1
Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.3
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Bronxville Lake

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative A Year 50

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.92	4.68	4.285	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.82	4.68	3.812	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.84	4.68	3.917	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.41	4.68	1.923	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.53	4.68	2.494	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

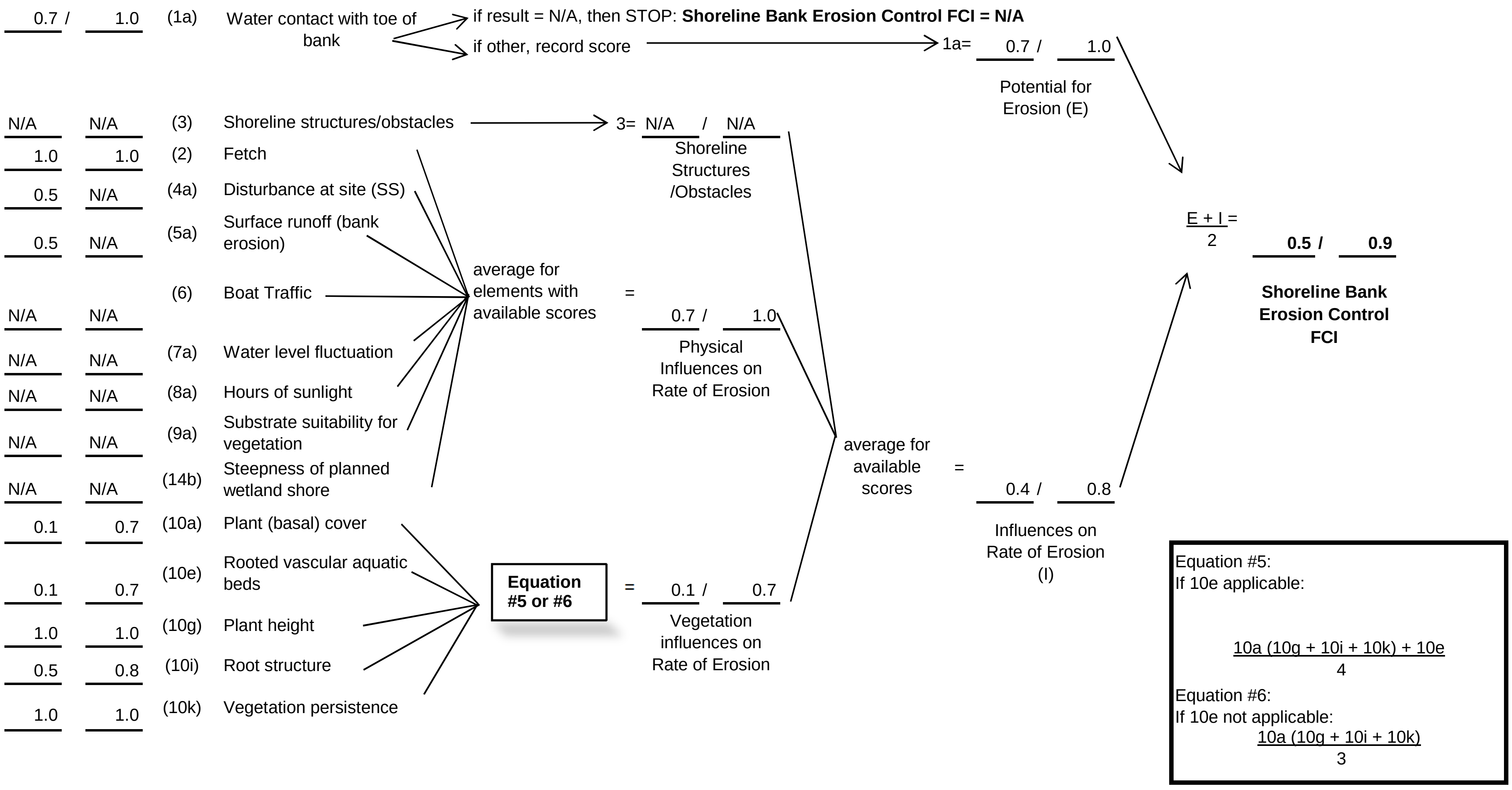
Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model



0.7 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.7 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.1 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.6 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

$\frac{DF + W}{2}$ = **0.5 /** **0.8** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

Equation #7:

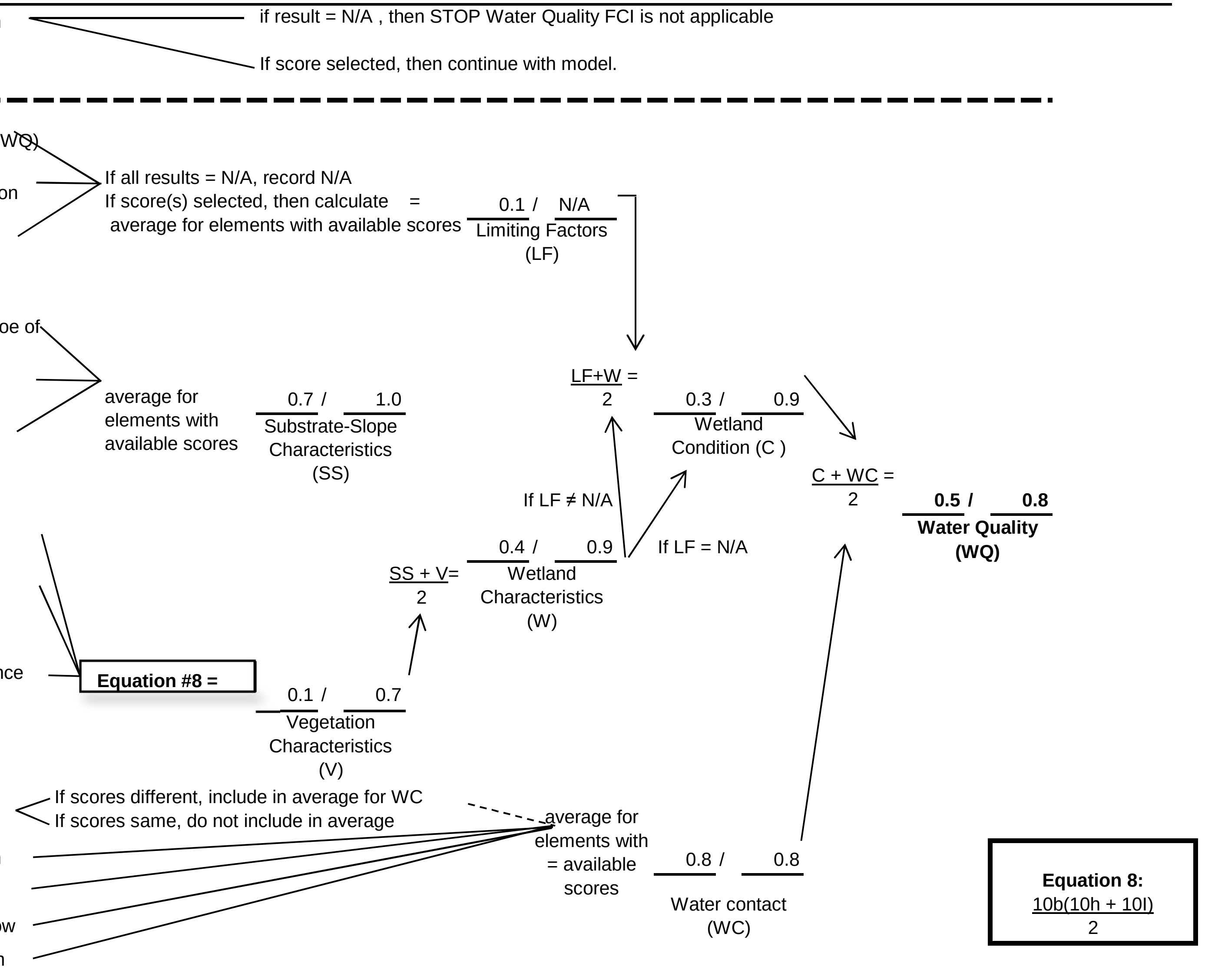
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Water Quality

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width
0.7	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.1	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
0.5	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth



Hydrologic condition (15): if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

(4b), (7a), (16a): If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

(1a), (5b), (14c): average for elements with available scores 0.7 / 1.0 Substrate-Slope Characteristics (SS)

(10b), (10h), (10l): **Equation #8 =** 0.1 / 0.7 Vegetation Characteristics (V)

SS + V= / 2 → 0.4 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 → 0.3 / 0.9 Wetland Condition (C)

If LF = N/A: → Wetland Condition (C)

(9b): If scores different, include in average for WC
If scores same, do not include in average

(9b), (15), (17), (18), (19): average for elements with available scores = 0.8 / 0.8 Water contact (WC)

C + WC = / 2 → **0.5 / 0.8 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Wildlife

Selected Scores		(#)	Element
Comparison:	/		(e.g., WAA/planned wetland)
N/A	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
0.1	N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores		(#)	Element
0.7	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8 Vegetation Strata

Selected Scores		(#)	Element
0.2	0.3	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.4 Vegetation Cover Types

Selected Scores		(#)	Element
0.5	0.5	(13a)	% open water
0.1	0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.3 Vegetation/ Water Proportions

Selected Scores		(#)	Element
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
0.1	0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.4 / 0.4 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ = **0.2 / 0.4**

If F = NA

Wildlife FCI

`

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

0.5 /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
0.1 /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / N/A Limiting Factors

0.5 /	1.0	(10m)	Vegetative overhang
0.3 /	0.7	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.8	(22b)	Available fish cover/attractors
0.1 /	0.5	(25a)	% pool area
0.1 /	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.6 Food/Cover

N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

0.1 /	0.5	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Upland Erosion Control

Selected Scores		(#)	Element
Comparison: ______________ \ ______________ (e.g., WAA/planned wetland)			

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9
Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**
Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~
Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
Comparison:__________ / __________ (e.g., WAA/planned wetland)			
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ ~~/~~	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 /** **1.0**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative A Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.7 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.1 / 0.6 Physical Features

average for available scores = 0.3 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.3
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative B Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.90	3.39	3.064	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.82	3.39	2.788	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.80	3.39	2.712	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.41	3.39	1.383	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.43	3.39	1.441	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.7 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.1 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.6 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.5 /** **0.8** **Sediment Stabilization FCI**

Equation #7:

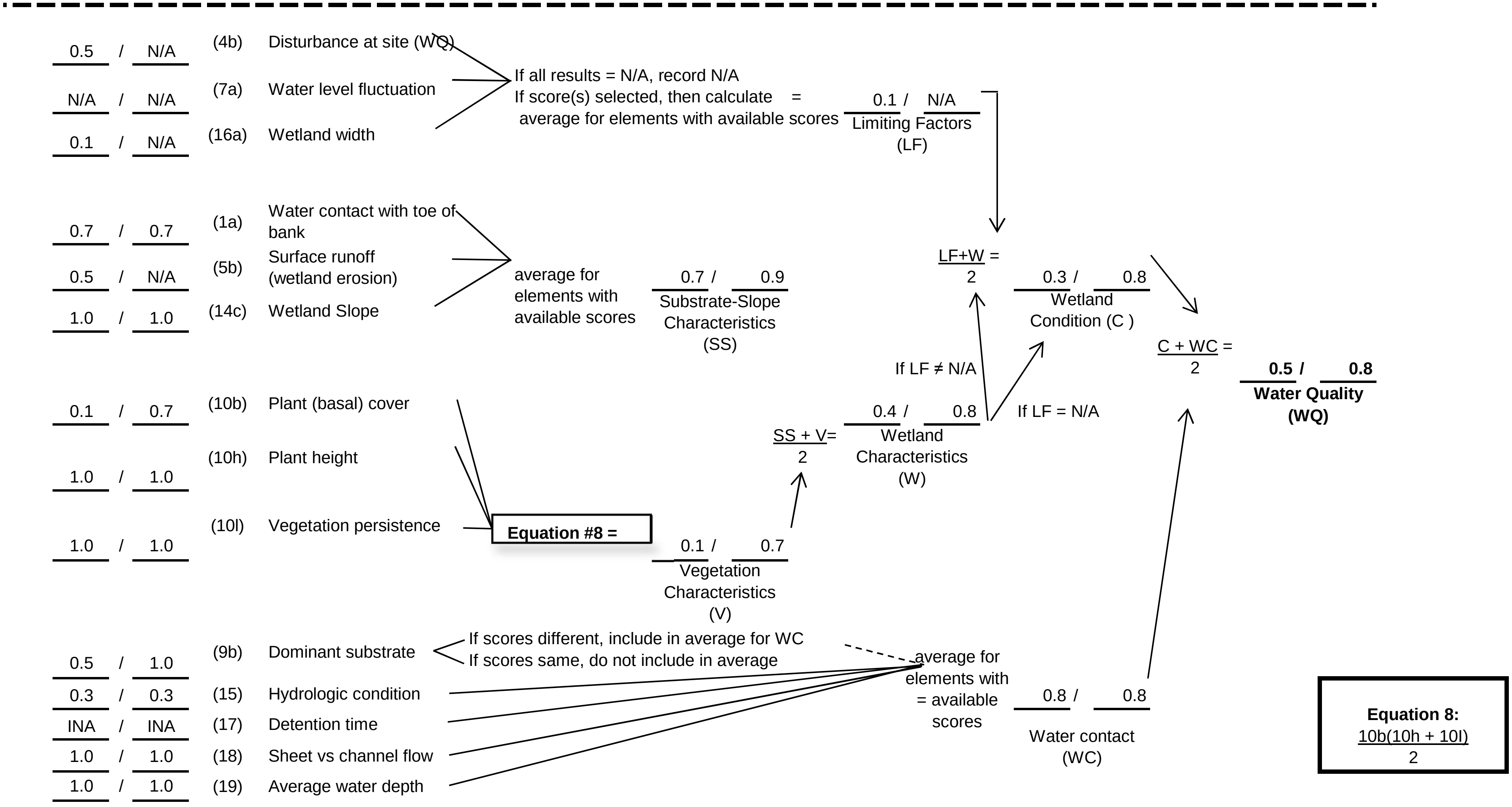
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Water Quality

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element	
0.3	0.3	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.



Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width
0.7	0.7	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.1	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
0.5	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

average for elements with available scores 0.7 / 0.9 Substrate-Slope Characteristics (SS)

Equation #8 = 0.1 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.8 Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.5 / 0.8 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Wildlife

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.2 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.3 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.3 / 0.3
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.1
Physical Features

average for available scores = 0.4 / 0.4
Habitat Complexity (HC)

If F ≠ NA

$$\frac{F + HC}{2} =$$ **0.2 / 0.4**

If F = NA

Wildlife FCI

`

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
0.5	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
0.5	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
N/A	/	N/A	(4d)	Disturbance in channel/open water
0.1	/	0.1	(16c)	Fish habitat size
0.5	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / 0.1 Limiting Factors

Selected Scores			(#)	Element
0.5	/	1.0	(10m)	Vegetative overhang
0.3	/	0.7	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.8	(22b)	Available fish cover/attractors
0.1	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.3 / 0.6 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.5		0.5	(27a)	Spawning substrate
N/A		N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
0.1	/	0.1	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**

Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 1.0**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative B Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.3	0.3	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees
0.1	0.1	(12a)	Cover types
0.1	0.5	(12b)	Ratio of cover types
0.1	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: **0.2 / 0.2 Wildlife FCI**

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 851. Bronxville Alternative C Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.54	0.30	0.162	0.60	1	0.1616	0.60	0.2693	0.75	0.96	0.717	Y
SS	0.53	0.30	0.159	0.58	1	0.1590	0.58	0.2741	0.58	0.96	0.551	Y
WQ	0.51	0.30	0.154	0.60	1	0.1538	0.60	0.2563	0.60	0.96	0.573	Y
WL	0.23	0.30	0.070	0.30	1	0.0698	0.30	0.2327	0.37	0.96	0.352	Y
FS	0.43	0.30	0.128	0.43	1	0.1275	0.43	0.2965	0.59	0.96	0.568	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores | (#) | Element

Comparison:__________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.7 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.7 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
0.5	0.5	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.7 / 0.7

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.1	0.3	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.1 / 0.3

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.5

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Sediment Stabilization

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / 0.5 Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores		(#)	Element
0.5	0.5	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

Selected Scores		(#)	Element
0.7	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope

average for elements with available scores 0.7 / 1.0 Substrate-Slope Characteristics (SS)

Selected Scores		(#)	Element
0.1	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.4 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.3 / 0.4 Wetland Condition (C)

If LF = N/A

Selected Scores		(#)	Element
0.5	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.5 / 0.6 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.3 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.3 / 0.3 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.4 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA: HC

0.2 / 0.4
Wildlife FCI

`

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element	
0.5 /	N/A	(24)	Obstruction to fish passage	if result = 0.1, STOP. There is no potential for providing tidal fish habitat if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element			
0.5 /	N/A	(1b)	Shoreline bank stability	average for elements with available scores	=	0.4 / N/A Limiting Factors
0.5 /	N/A	(4a)	Disturbance at site (SS)			
N/A /	N/A	(4d)	Disturbance in channel/open water			
0.1 /	N/A	(16c)	Fish habitat size			
0.5 /	N/A	(24)	Obstruction to fish passage			
0.5 /	0.5	(10m)	Vegetative overhang	average for elements with available scores	=	0.3 / 0.5 Food/Cover
0.3 /	0.3	(10o)	Plant biomass			
0.5 /	0.5	(21b)	Shape of wetland/water edge			
0.3 /	0.8	(22b)	Available fish cover/attractors			
0.1 /	1.0	(25a)	% pool area			
0.1 /	0.1	(26)	Bank account			
N/A /	N/A	(25b)	Current velocity within pools	average for elements with available scores	=	0.5 / 0.8 Reproduction
0.5	0.5	(27a)	Spawning substrate			
N/A	1.0	(27b)	Spawning structures			
0.5 /	0.5	(20b)	Water quality rating	If score available, record score for WQ If information not available, continue		
0.1 /	0.1	(20c)	Nutrient/sediment/contaminant sources	average for elements with available scores	=	0.5 / 0.5 Water Quality (WQ)
INA /	INA	(20d)	Dissolved Oxygen			
INA /	INA	(20e)	pH			
INA /	INA	(20f)	Maximum water temperature			
INA /	INA	(20g)	Turbidity			

average for available scores = **0.4 / 0.6**

Fish (Non-Tidal Stream/River)

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.9

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.9**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~ = 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.9 Vegetation Characteristics (V)

(14c) = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.4 / 1.0 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.5 / 1.0** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 851. Bronxville Alternative C Year 50

Calculation of Wildlife (Upland)

Comparison:__________________ / __________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

4c, 20a, 16b: If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

11a, 11b, 11c: average for elements with available scores = 0.7 / 0.7 Vegetation Strata

12a, 12b, 12c, 12d: average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

13a, 13b: average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

21a, 22a, 23: average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.2 Wildlife FCI**

If F = NA: HC = **Wildlife FCI**

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Crestwood Lake

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.95	5.97	5.668	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.87	5.97	5.176	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.81	5.97	4.823	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.60	5.97	3.609	Y
FS	0.36	2.00	0.717	0.37	1	0.7167	0.37	1.9369	0.67	5.97	4.011	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

1.0	1.0	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

4a, 7a → if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.5 / N/A Disturbance Factors (DF)

10b, 10c, 10j, 10l → **Equation #7** = 0.3 / 0.7 Vegetation Characteristics (V)

14c → = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.6 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

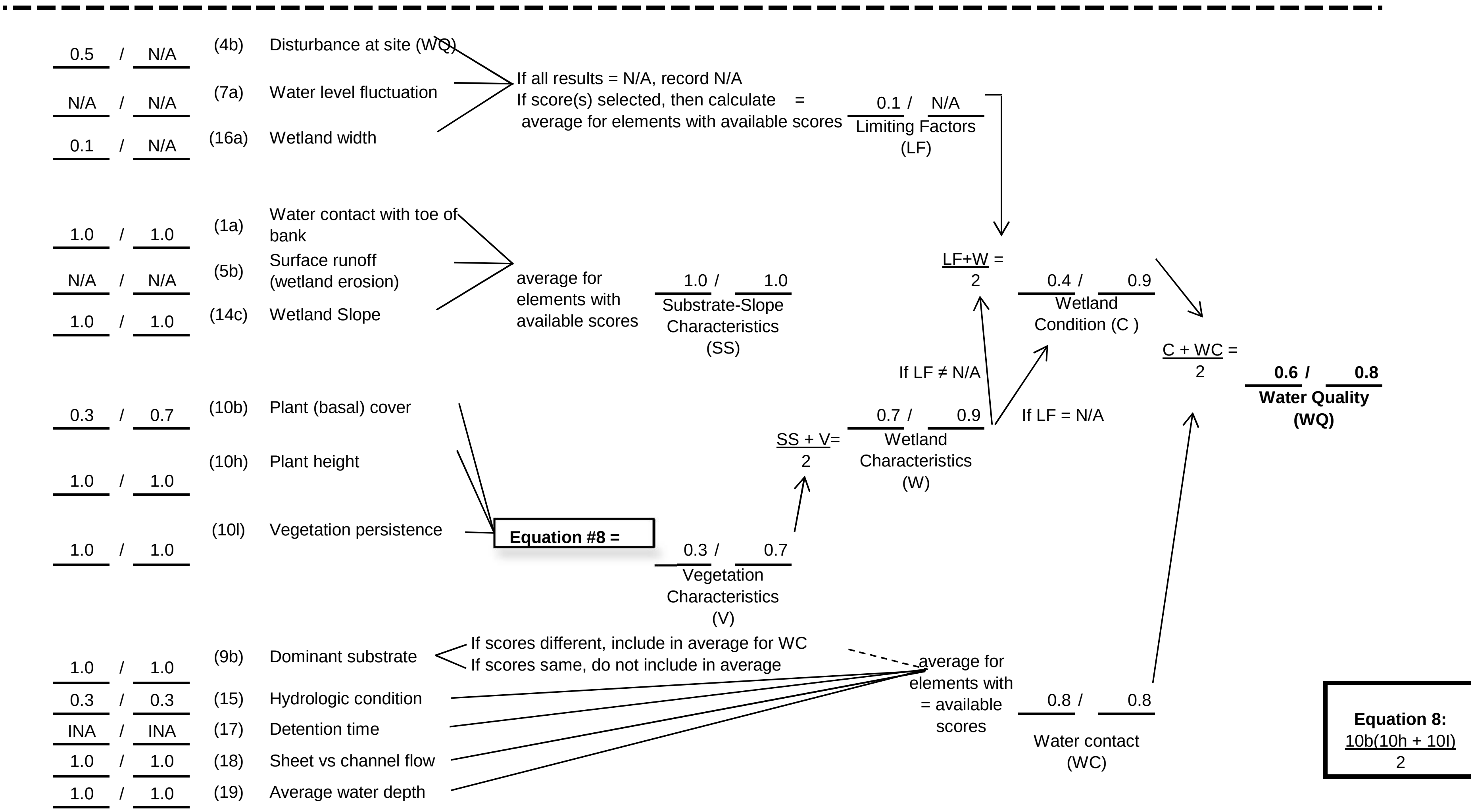
Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.3	0.7	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
1.0	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Equation #8 = 0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.7 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.9 Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.6 / 0.8 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Wildlife

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.3	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
0.5 / 0.5	(13a)	% open water
0.5 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.5 / 0.5
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
1.0 / 1.0	(23)	Islands

average for elements with available scores = 0.7 / 0.7
Physical Features

average for available scores = 0.6 / 0.6
Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.3 / 0.6
Wildlife FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

N/A /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
N/A /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

0.1 /	0.5	(10m)	Vegetative overhang
0.3 /	0.3	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.3 /	0.3	(22b)	Available fish cover/attractors
0.1 /	0.5	(25a)	% pool area
0.1 /	1.0	(26)	Bank account

average for elements with available scores = 0.2 / 0.5 Food/Cover

N/A /	N/A	(25b)	Current velocity within pools
0.2	1.0	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 1.0 Reproduction

0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 /** **0.7** **Fish (Non-Tidal Stream/River)**

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~ = 0.5 / 0.0 Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 /** **0.4** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative A Year 50

Calculation of Wildlife (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.9 / 0.9 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.5 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.95	2.32	2.204	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.82	2.32	1.891	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.62	2.32	1.440	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.35	2.32	0.807	Y
FS	0.36	2.00	0.717	0.37	1	0.7167	0.37	1.9369	0.38	2.32	0.889	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

1.0	1.0	(10a)	Plant (basal) cover
0.1	0.7	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Sediment Stabilization

Selected Scores	(#)	Element

Comparison: ______ / ______ (e.g., WAA/planned wetland)

0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.6
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.6 /** **0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Water Quality

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.3 / 0.3	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.

0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

1.0 / 1.0	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
1.0 / 1.0	(14c)	Wetland Slope

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

0.3 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.7 / 0.9 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.4 / 0.5 Wetland Condition (C)

If LF = N/A → Wetland Condition (C)

1.0 / 1.0	(9b)	Dominant substrate	If scores different, include in average for WC If scores same, do not include in average
0.3 / 0.3	(15)	Hydrologic condition	
INA / INA	(17)	Detention time	
1.0 / 1.0	(18)	Sheet vs channel flow	
1.0 / 1.0	(19)	Average water depth	

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.6 / 0.6 Water Quality (WQ)**

Equation 8:
$\frac{10b(10h + 10l)}{2}$

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Wildlife

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.5 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
1.0 / 1.0	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.5 / 0.5 Vegetation/Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.7 / 0.7 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3**

If F = NA: **Wildlife FCI** = HC

Wildlife FCI = **0.3 / 0.3**

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

0.5	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

N/A	N/A	(1b)	Shoreline bank stability
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

0.1	0.5	(10m)	Vegetative overhang
0.3	0.3	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.1	0.1	(25a)	% pool area
0.1	1.0	(26)	Bank account

average for elements with available scores = 0.2 / 0.5 Food/Cover

N/A	N/A	(25b)	Current velocity within pools
0.2	0.2	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.2 Reproduction

0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Uniqueness/Heritage

Comparison: ____________ / ____________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~ = 0.5 / 0.5
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 /** **0.7**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative B Year 50

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.9 / 0.9 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.5 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.85	2.00	1.700	0.95	1	1.7000	0.95	1.7895	0.96	1.70	1.630	Y
SS	0.57	2.00	1.130	0.67	1	1.1300	0.67	1.6866	0.67	1.70	1.133	Y
WQ	0.57	2.00	1.142	0.60	1	1.1417	0.60	1.9028	0.57	1.70	0.973	Y
WL	0.35	2.00	0.696	0.35	1	0.6957	0.35	1.9877	0.35	1.70	0.595	Y
FS	0.36	2.00	0.717	0.40	1	0.7167	0.40	1.7917	0.49	1.70	0.833	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

1.0 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 1.0 / 1.0

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.8 / 1.0

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.7 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.9 / 1.0**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.3 Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.6 / 0.7 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.6 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1\text{-}10b)}{2}$$

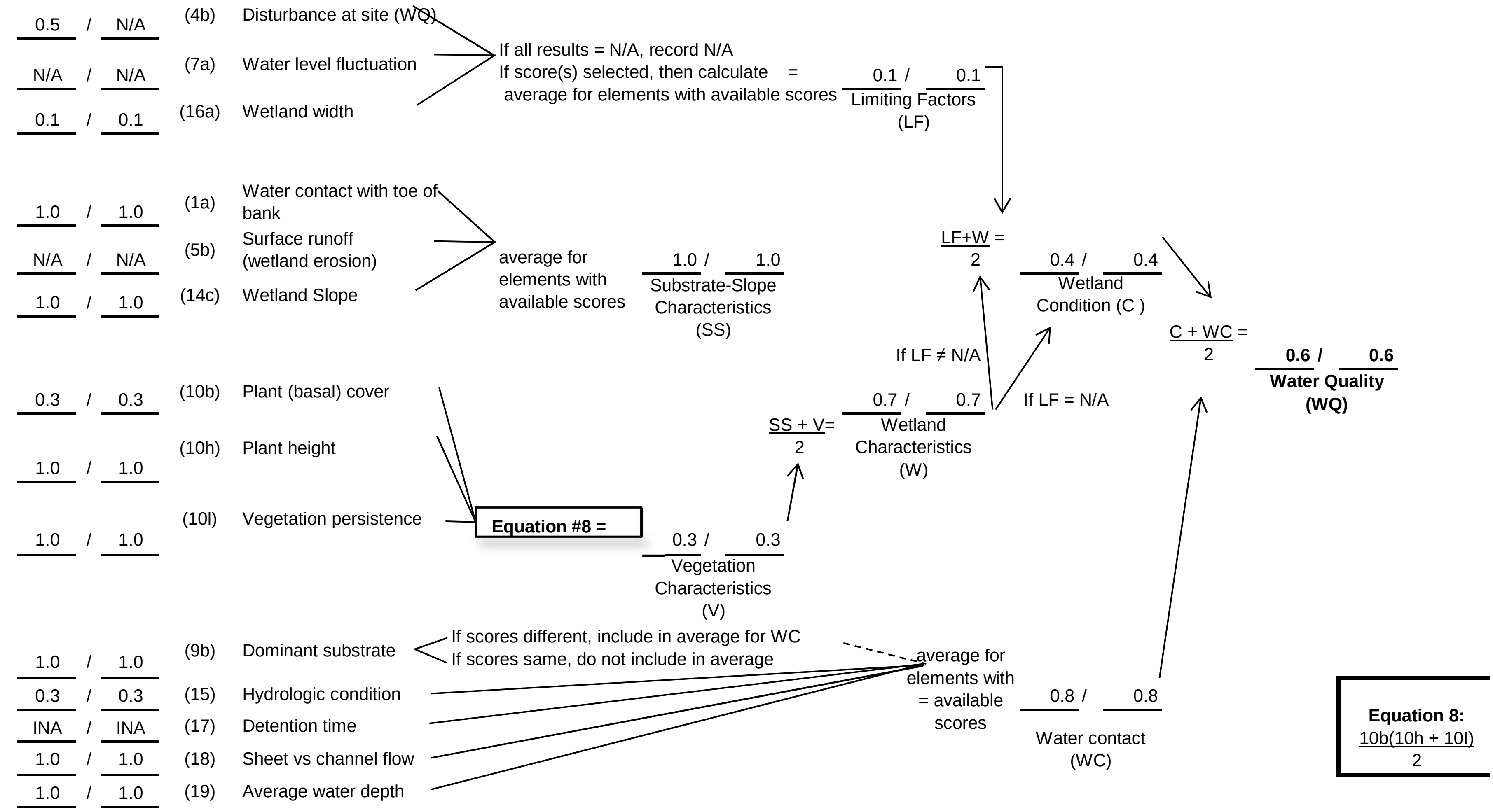
Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Water Quality

Selected Scores		(#)	Element
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)
0.3	0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



Selected Scores		(#)	Element
0.5	N/A	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	0.1	(16a)	Wetland width
1.0	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
1.0	1.0	(14c)	Wetland Slope
0.3	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
1.0	1.0	(9b)	Dominant substrate
0.3	0.3	(15)	Hydrologic condition
INA	INA	(17)	Detention time
1.0	1.0	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

average for elements with available scores 1.0 / 1.0 Substrate-Slope Characteristics (SS)

Equation #8 = 0.3 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.7 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ = 0.4 / 0.4 Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.8 / 0.8 Water contact (WC)

$\frac{C + WC}{2}$ = **0.6 / 0.6 Water Quality (WQ)**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Wildlife

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / 0.1	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.5 / 0.5	(13a)	% open water
0.5 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
1.0 / 1.0	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.5 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.7 / 0.7 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.6 / 0.6 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

`

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
0.5	/	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
N/A	/	N/A	(1b)	Shoreline bank stability
0.5	/	N/A	(4a)	Disturbance at site (SS)
N/A	/	N/A	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
0.5	/	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores			(#)	Element
0.1	/	0.5	(10m)	Vegetative overhang
0.3	/	0.3	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.3	/	0.3	(22b)	Available fish cover/attractors
0.1	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.2 / 0.4 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.2	(27a)	Spawning substrate
N/A		1.0	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.6 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.5**

Fish (Non-Tidal Stream/River)

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Uniqueness/Heritage

Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	0.5	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.5

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / 0.5

Vegetation influences on Rate of Erosion

average for available scores = **0.5 / 0.5**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	0.5	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.1	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.5 / 0.5 Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8 Vegetation Characteristics (V)

(14c): = 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 /** **0.7** **Sediment Stabilization FCI**

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 852. Crestwood Lake Alternative C Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
1.0 / 1.0	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
1.0 / 1.0	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.9 / 0.9 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.4 / 0.4 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a)–(23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.5 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3 Wildlife FCI**

If F = NA: **Wildlife FCI**

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Harney Road & Garth Woods

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.46	0.20	0.092	0.60	1	0.0919	0.60	0.1531	0.68	0.32	0.218	Y
SS	0.10	0.20	0.020	0.15	1	0.0200	0.15	0.1333	0.63	0.32	0.203	Y
WQ	0.44	0.20	0.088	0.55	1	0.0877	0.55	0.1595	0.59	0.32	0.191	Y
WL	0.23	0.20	0.046	0.40	1	0.0458	0.40	0.1145	0.45	0.32	0.144	Y
FS	0.39	0.20	0.078	0.39	1	0.0775	0.39	0.1987	0.39	0.32	0.125	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA

**Target FCI = *goal* established by decision makers

R = multiplying factor established by decision makers

Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)

Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)

Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.1	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.8 / 0.8

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.1 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.4 / 0.7

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.678**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4a)	Disturbance at site
N/A / N/A	(7a)	Water level fluctuation
0.1 / 0.3	(10b)	Plant (basal) cover
0.1 / 0.1	(10c)	Leaf litter and debris cover
0.1 / 0.5	(10j)	Root structure
1.0 / 1.0	(10l)	Vegetation Persistence
0.1 / 1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A Disturbance Factors (DF)

Equation #7 = 0.1 / 0.3 Vegetation Characteristics (V)

= 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.6 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.6**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Water Quality

Selected Scores		(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

0.1 / 0.1 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5 / 0.5 (4b) Disturbance at site (WQ)

N/A / N/A (7a) Water level fluctuation

N/A / N/A (16a) Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.5 / 0.5 Limiting Factors (LF)

0.5 / 0.7 (1a) Water contact with toe of bank

N/A / N/A (5b) Surface runoff (wetland erosion)

0.1 / 1.0 (14c) Wetland Slope

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

0.1 / 0.3 (10b) Plant (basal) cover

0.5 / 1.0 (10h) Plant height

1.0 / 1.0 (10l) Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ =

If LF = N/A:

0.3 / 0.5 Wetland Condition (C)

0.1 / 1.0 (9b) Dominant substrate

If scores different, include in average for WC
If scores same, do not include in average

0.1 / 0.1 (15) Hydrologic condition

INA / INA (17) Detention time

0.5 / 0.5 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with = available scores 0.5 / 0.7 Water contact (WC)

$\frac{C + WC}{2}$ = **0.4 / 0.6 Water Quality (WQ)**

Equation 8:

$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Wildlife

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.5 / 1.0	(11a)	Layers
0.1 / 0.3	(11b)	Condition of Layers
N/A / N/A	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.3	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.1	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.3 / 0.7
Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.4
Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.3
Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.4 / 0.4
Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
0.5	/	0.5	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores			(#)	Element
0.5	/	0.5	(1b)	Shoreline bank stability
N/A	/	N/A	(4a)	Disturbance at site (SS)
0.5	/	0.5	(4d)	Disturbance in channel/open water
N/A	/	N/A	(16c)	Fish habitat size
0.5	/	0.5	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / 0.5 Limiting Factors

Selected Scores			(#)	Element
0.1	/	0.1	(10m)	Vegetative overhang
0.1	/	0.1	(10o)	Plant biomass
0.5	/	0.5	(21b)	Shape of wetland/water edge
0.8	/	0.8	(22b)	Available fish cover/attractors
0.5	/	0.5	(25a)	% pool area
0.1	/	0.1	(26)	Bank account

average for elements with available scores = 0.4 / 0.4 Food/Cover

Selected Scores			(#)	Element
N/A	/	N/A	(25b)	Current velocity within pools
0.2		0.2	(27a)	Spawning substrate
N/A		N/A	(27b)	Spawning structures

average for elements with available scores = 0.2 / 0.2 Reproduction

Selected Scores			(#)	Element
0.5	/	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores			(#)	Element
INA	/	INA	(20c)	Nutrient/sediment/contaminant sources
INA	/	INA	(20d)	Dissolved Oxygen
INA	/	INA	(20e)	pH
INA	/	INA	(20f)	Maximum water temperature
INA	/	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.4**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Uniqueness/Heritage

Comparison: ____________________ / ____________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Upland Erosion Control

Comparison:____________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
0.7	0.7	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

[redacted]

1a= ~~N/A~~ / ~~N/A~~
Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~
Shoreline Structures /Obstacles

average for elements with available scores = N/A / N/A
Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.5 / #####
Vegetation influences on Rate of Erosion

average for available scores = **0.5 / #####**
Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
0.3 /	0.3	(10b)	Plant (basal) cover
0.7 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.5 / 0.5
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.7 / 0.7
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.7**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Garth Woods Alternative A-2 Year 50

Calculation of Wildlife (Upland)

Selected Scores	(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = N/A / N/A
Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.8 / 0.8
Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.1	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.4 / 0.4
Vegetation Cover Types

Selected Scores	(#)	Element
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion

average for elements with available scores = ~~N/A~~ / ~~N/A~~
Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 0.1	(21a)	Shape of upland/wetland edge
1.0 / 1.0	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

average for elements with available scores = 0.6 / 0.6
Physical Features

average for available scores = 0.6 / 0.6
Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.6 / 0.6
Wildlife FCI

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative A Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.94	1.53	1.435	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.76	1.53	1.163	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.69	1.53	1.055	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.39	1.53	0.591	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.66	1.53	1.006	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	1.0	(1a)	Water contact with toe of bank
N/A	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
0.3	0.7	(10a)	Plant (basal) cover
0.1	1.0	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0

Potential for Erosion (E)

(3) → 3= N/A / N/A

Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.2 / 0.7

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.9

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Sediment Stabilization

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= N/A / N/A
Disturbance Factors (DF)

Equation #7 = 0.1 / 0.5
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.8**

Sediment Stabilization FCI

Equation #7:

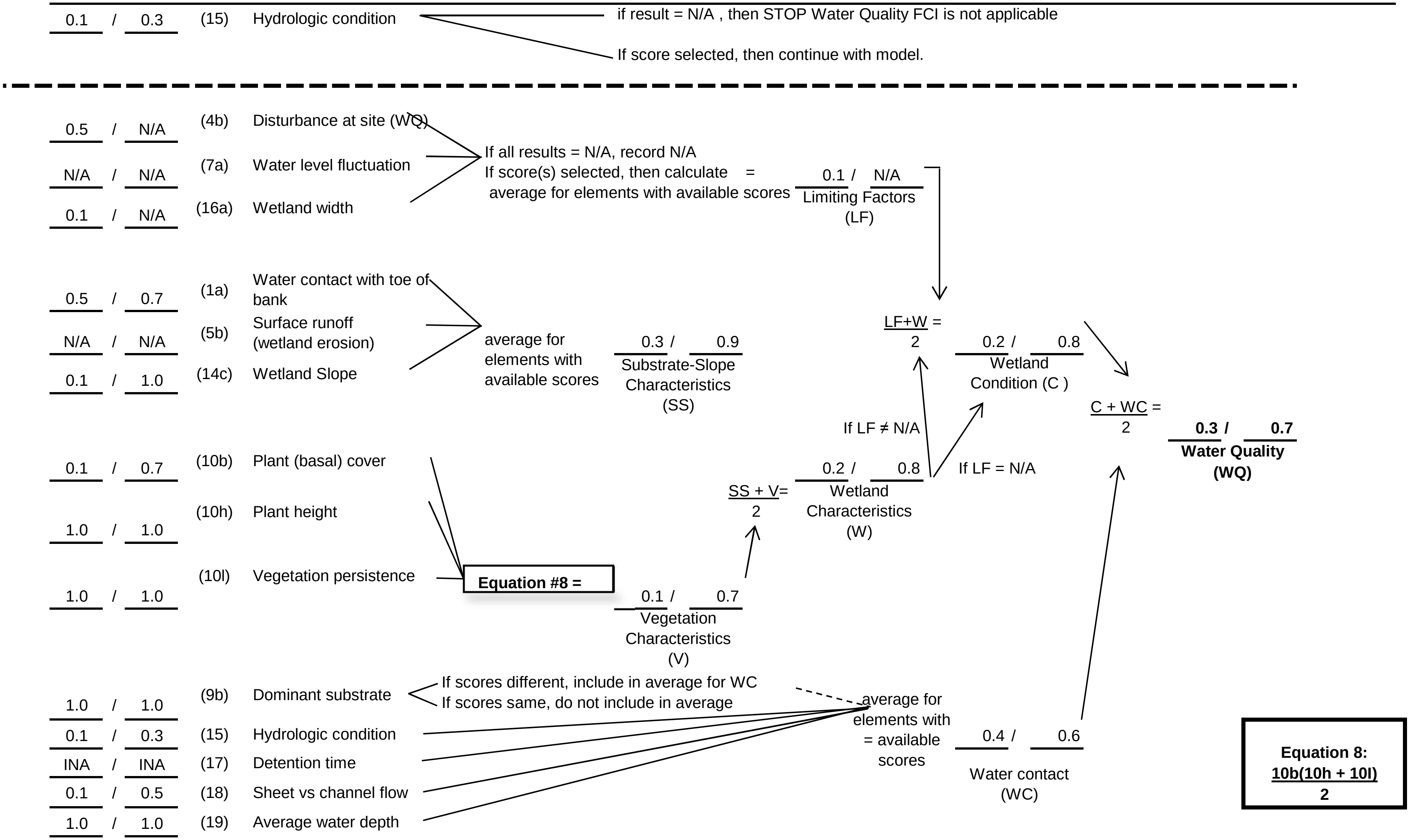
$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Water Quality

Selected Scores	(#)	Element

Comparison:__________________ / __________________ (e.g., WAA/planned wetland)



Selected Scores	(#)	Element
0.1 / 0.3	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.1 / 0.7	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.7 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ =

If LF = N/A:

0.2 / 0.8 Wetland Condition (C)

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.3	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.5	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.6 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.7 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
0.5 /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.1 /	3.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.1 /	0.3	(22b)	Available fish cover/attractors
0.5 /	1.0	(25a)	% pool area
0.1 /	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.0 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	#N/A	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.7**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison: ______________________ / ______________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / #####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ **/** ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 853. Harney Road Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	#N/A	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / #N/A
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / #N/A**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 853. Harney Road

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	N/A	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.3	0.7	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees
0.1	0.1	(12a)	Cover types
0.1	0.1	(12b)	Ratio of cover types
0.5	0.5	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative B Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.75	0.97	0.727	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.87	0.97	0.837	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.55	0.97	0.535	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.39	0.97	0.372	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.85	0.97	0.820	Y
UH	1.0			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores (#) Element

Comparison:________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
N/A	N/A	(3)	Shoreline structures/obstacles

3= N/A / N/A

Shoreline Structures /Obstacles

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

Selected Scores		(#)	Element
0.3	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\,(10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\,(10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.7	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a = N/A / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.7
Vegetation Characteristics (V)

(14c) = 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Water Quality

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

Selected Scores	(#)	Element
0.5 / N/A	(4b)	Disturbance at site (WQ)
N/A / N/A	(7a)	Water level fluctuation
0.1 / N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / N/A Limiting Factors (LF)

Selected Scores	(#)	Element
0.5 / 0.7	(1a)	Water contact with toe of bank
N/A / N/A	(5b)	Surface runoff (wetland erosion)
0.1 / 1.0	(14c)	Wetland Slope

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

Selected Scores	(#)	Element
0.1 / 0.3	(10b)	Plant (basal) cover
1.0 / 1.0	(10h)	Plant height
1.0 / 1.0	(10l)	Vegetation persistence

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.2 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.2 / 0.6 Wetland Condition (C)

If LF = N/A: Wetland Condition (C)

Selected Scores	(#)	Element
1.0 / 1.0	(9b)	Dominant substrate
0.1 / 0.1	(15)	Hydrologic condition
INA / INA	(17)	Detention time
0.1 / 0.5	(18)	Sheet vs channel flow
1.0 / 1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.5 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.6 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Wildlife

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A; If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.7 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5 /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5 /	N/A	(1b)	Shoreline bank stability
N/A /	N/A	(4a)	Disturbance at site (SS)
0.5 /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
0.5 /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1 /	0.5	(10m)	Vegetative overhang
0.1 /	3.0	(10o)	Plant biomass
0.5 /	0.5	(21b)	Shape of wetland/water edge
0.1 /	0.8	(22b)	Available fish cover/attractors
0.5 /	1.0	(25a)	% pool area
0.1 /	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.1 Food/Cover

Selected Scores		(#)	Element
N/A /	N/A	(25b)	Current velocity within pools
0.5	1.0	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 1.0 Reproduction

Selected Scores		(#)	Element
0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.9**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Uniqueness/Heritage

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / #####

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / #####**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ **/** ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 853. Harney Road Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	#N/A	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.5 / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / #N/A Vegetation Characteristics (V)

(14c) = 1.0 / 1.0 Slope Stability (S)

$$\frac{V+S}{2} = 0.9\ /\ \#N/A$$

Wetland Characteristics (W)

$$\frac{DF+W}{2} = \mathbf{0.7\ /\ \#N/A}$$

If DF= N/A

If DF= N/A

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title:Site 853. Harney Road Alternative B Year 50

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

`

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 853. Harney Road Alternative C Year 50

Comparison between WAA#______________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.55	0.60	0.332	0.70	1	0.3319	0.70	0.4741	0.75	0.97	0.727	Y
SS	0.11	0.60	0.066	0.30	1	0.0660	0.30	0.2200	0.69	0.97	0.663	Y
WQ	0.28	0.60	0.165	0.40	1	0.1650	0.40	0.4125	0.54	0.97	0.517	Y
WL	0.17	0.60	0.104	0.30	1	0.1037	0.30	0.3457	0.34	0.97	0.324	Y
FS	0.43	0.60	0.260	0.60	1	0.2600	0.60	0.4333	0.66	0.97	0.633	Y
UH	1.0			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Selected Scores		(#)	Element

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 0.7

Potential for Erosion (E)

N/A	N/A	(3)	Shoreline structures/obstacles

→ 3= N/A / N/A

Shoreline Structures /Obstacles

1.0	1.0	(2)	Fetch
N/A	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
N/A	N/A	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore

average for elements with available scores = 1.0 / 1.0

Physical Influences on Rate of Erosion

0.3	0.7	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

Equation #5 or #6 = 0.2 / 0.6

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.6 / 0.8**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Sediment Stabilization

Comparison:_______________________________ / _______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
N/A /	N/A	(4a)	Disturbance at site
N/A /	N/A	(7a)	Water level fluctuation
0.1 /	0.3	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a = N/A / N/A Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.1 / 0.4 Vegetation Characteristics (V)

(14c): = 0.1 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.1 / 0.7 Wetland Characteristics (W)

$\frac{DF+W}{2}$ = **0.1 / 0.7** **Sediment Stabilization FCI**

If DF= N/A

If DF= N/A

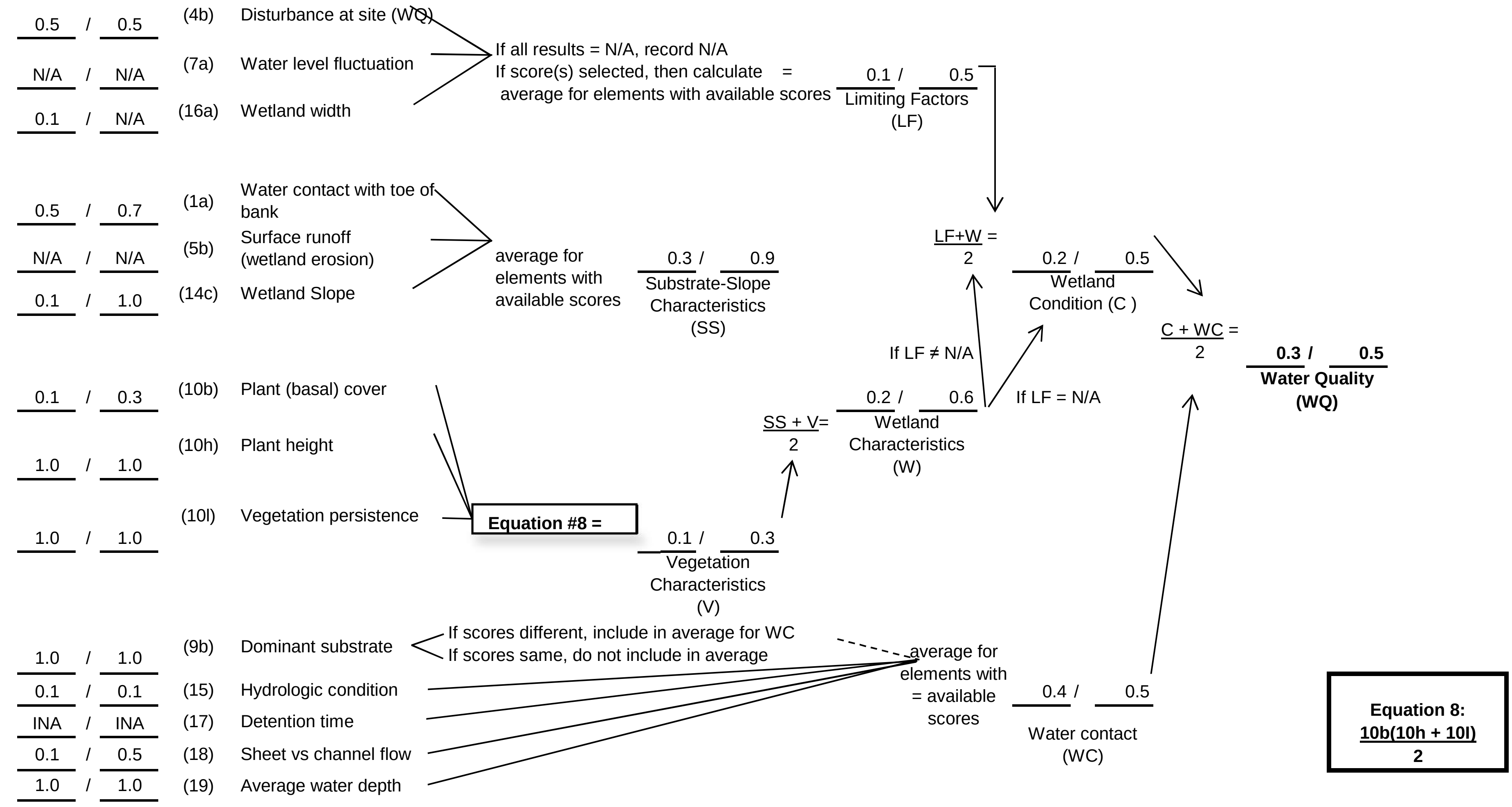
Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Water Quality

Selected Scores		(#)	Element	
			Comparison:________________ / ________________ (e.g., WAA/planned wetland)	
0.1	0.1	(15)	Hydrologic condition	if result = N/A , then STOP Water Quality FCI is not applicable If score selected, then continue with model.



Selected Scores		(#)	Element
0.5	0.5	(4b)	Disturbance at site (WQ)
N/A	N/A	(7a)	Water level fluctuation
0.1	N/A	(16a)	Wetland width
0.5	0.7	(1a)	Water contact with toe of bank
N/A	N/A	(5b)	Surface runoff (wetland erosion)
0.1	1.0	(14c)	Wetland Slope
0.1	0.3	(10b)	Plant (basal) cover
1.0	1.0	(10h)	Plant height
1.0	1.0	(10l)	Vegetation persistence
1.0	1.0	(9b)	Dominant substrate
0.1	0.1	(15)	Hydrologic condition
INA	INA	(17)	Detention time
0.1	0.5	(18)	Sheet vs channel flow
1.0	1.0	(19)	Average water depth

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.5 Limiting Factors (LF)

average for elements with available scores 0.3 / 0.9 Substrate-Slope Characteristics (SS)

Equation #8 = 0.1 / 0.3 Vegetation Characteristics (V)

SS + V= / 2 → 0.2 / 0.6 Wetland Characteristics (W)

If LF ≠ N/A: LF+W = / 2 → 0.2 / 0.5 Wetland Condition (C)

If LF = N/A

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores 0.4 / 0.5 Water contact (WC)

C + WC = / 2 → **0.3 / 0.5**
Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Wildlife

Selected Scores	(#)	Element
Comparison: __________ / __________ (e.g., WAA/planned wetland)		
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 1.0	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.3	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.1	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.1	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.1 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = 0.1 / 0.3 Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/ Water Proportions, Physical Features: average for available scores = 0.2 / 0.3 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.3
Wildlife FCI

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
0.5	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.5	N/A	(1b)	Shoreline bank stability
N/A	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
0.5	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.5 / N/A Limiting Factors

Selected Scores		(#)	Element
0.1	0.5	(10m)	Vegetative overhang
0.1	3.0	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.1	0.3	(22b)	Available fish cover/attractors
0.5	1.0	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.2 / 1.0 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.4 / 0.7**

Fish (Non-Tidal Stream/River)

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Uniqueness/Heritage

Selected Scores		(#)	Element
			Comparison: ______ / ______ (e.g., WAA/planned wetland)
Site Suitability For Planned Wetland:			
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = 1.0 / 1.0

Uniqueness/ Heritage FCI

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= N/A / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / ######

Vegetation influences on Rate of Erosion

average for available scores = **0.6 /** **#####**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ **/** ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	#N/A	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a ~~and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~ = 0.5 / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / #N/A
Vegetation Characteristics (V)

(14c) = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / #N/A
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / #N/A**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 853. Harney Road Alternative C Year 50

Calculation of Wildlife (Upland)

Comparison:______________________ / ______________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.1	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.5 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.7 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.2 / 0.2 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.3 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.4
Wildlife FCI

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Westchester County Center

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative A Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.89	5.09	4.520	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.95	5.09	4.838	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.61	5.09	3.094	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.53	5.09	2.688	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.69	5.09	3.536	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	1.0	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.7	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(3) → 3= 0.5 / N/A

Shoreline Structures /Obstacles

(2)–(14b): average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

(10a)–(10k): **Equation #5 or #6** = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$$\frac{E + I}{2} =$$ **0.5 / 0.9**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Sediment Stabilization

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
0.1 /	N/A	(7a)	Water level fluctuation
0.3 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.1 / N/A
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.9
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 1.0
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 1.0**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Water Quality

Selected Scores			(#)	Element

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5	/	N/A	(4b)	Disturbance at site (WQ)
0.1	/	N/A	(7a)	Water level fluctuation
0.1	/	N/A	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores =

0.1 / N/A
Limiting Factors (LF)

0.5	/	1.0	(1a)	Water contact with toe of bank
0.5	/	N/A	(5b)	Surface runoff (wetland erosion)
0.1	/	1.0	(14c)	Wetland Slope

average for elements with available scores

0.4 / 1.0
Substrate-Slope Characteristics (SS)

0.3	/	0.7	(10b)	Plant (basal) cover
0.8	/	0.8	(10h)	Plant height
1.0	/	1.0	(10l)	Vegetation persistence

Equation #8 =

0.3 / 0.6
Vegetation Characteristics (V)

$\frac{SS + V}{2}$ =

0.3 / 0.8
Wetland Characteristics (W)

If LF ≠ N/A

$\frac{LF+W}{2}$ =

If LF = N/A

0.2 / 0.8
Wetland Condition (C)

1.0	/	1.0	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.1	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with = available scores

0.4 / 0.4
Water contact (WC)

$\frac{C + WC}{2}$ =

0.3 / 0.6
Water Quality (WQ)

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Wildlife

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size

If 4c, 16b and 20a = N/A, record N/A
If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

Selected Scores	(#)	Element
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees

average for elements with available scores = 0.5 / 0.7 Vegetation Strata

Selected Scores	(#)	Element
0.1 / 0.2	(12a)	Cover types
0.1 / 0.5	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species

average for elements with available scores = 0.1 / 0.4 Vegetation Cover Types

Selected Scores	(#)	Element
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion

average for elements with available scores = 0.1 / 0.5 Vegetation/ Water Proportions

Selected Scores	(#)	Element
0.1 / 1.0	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

average for elements with available scores = 0.1 / 0.6 Physical Features

average for available scores = 0.2 / 0.5 Habitat Complexity (HC)

If F ≠ NA

$\frac{F + HC}{2}$ =

If F = NA

0.2 / 0.5
Wildlife FCI

`

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores (#) Element Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A /	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

0.1 /	N/A	(1b)	Shoreline bank stability
0.5 /	N/A	(4a)	Disturbance at site (SS)
0.5 /	N/A	(4d)	Disturbance in channel/open water
N/A /	N/A	(16c)	Fish habitat size
N/A /	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.367 / N/A Limiting Factors

0.5 /	1.0	(10m)	Vegetative overhang
0.7 /	0.7	(10o)	Plant biomass
0.5 /	1.0	(21b)	Shape of wetland/water edge
0.3 /	0.3	(22b)	Available fish cover/attractors
0.5 /	1.0	(25a)	% pool area
0.1 /	1.0	(26)	Bank account

average for elements with available scores = 0.4 / 0.8 Food/Cover

N/A /	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	1.0	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.8 Reproduction

0.5 /	0.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

INA /	INA	(20c)	Nutrient/sediment/contaminant sources
INA /	INA	(20d)	Dissolved Oxygen
INA /	INA	(20e)	pH
INA /	INA	(20f)	Maximum water temperature
INA /	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 0.5 Water Quality (WQ)

average for available scores = **0.5 / 0.7**

Fish (Non-Tidal Stream/River)

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Uniqueness/Heritage

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(29)	Endangered species
N/A	N/A	(30)	Rarity
N/A	N/A	(31)	Unique features
N/A	N/A	(32)	Historical or archaeological significance
N/A	N/A	(33)	Natural landmark
N/A	N/A	(34)	Connected to Wild and Scenic River
1.0	1.0	(35)	Park, sanctuary, etc.
N/A	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Upland Erosion Control

Selected Scores		(#)	Element

Comparison:__________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~

10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a~~ and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8 Vegetation Characteristics (V)

= 1.0 / 1.0 Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9 Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / 0.9**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative A Year 50

Calculation of Wildlife (Upland)

Comparison:________________________ / ________________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3 Wildlife FCI**

If F = NA: HC = **0.3 / 0.3 Wildlife FCI**

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative B Year 50

Comparison between WAA#____________________ and wetland # ____________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.89	3.70	3.311	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.84	3.70	3.102	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.46	3.70	1.712	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.38	3.70	1.415	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.86	3.70	3.190	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	1.0	(1a)	Water contact with toe of bank
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.8	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

(1a): if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score → 1a= 0.5 / 1.0 Potential for Erosion (E)

(3) → 3= 0.5 / N/A Shoreline Structures /Obstacles

(2), (4a), (5a), (6), (7a), (8a), (9a), (14b): average for elements with available scores = 0.5 / 0.8 Physical Influences on Rate of Erosion

(10a), (10e), (10g), (10i), (10k): **Equation #5 or #6** = 0.7 / 0.8 Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8 Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.9** **Shoreline Bank Erosion Control FCI**

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Sediment Stabilization

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
0.1 /	N/A	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

(4a), (7a): if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a
= 0.1 / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.3 / 0.7
Vegetation Characteristics (V)

(14c) = 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.1 / 0.8**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\,(10j + 10l) + 10c\,(1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Water Quality

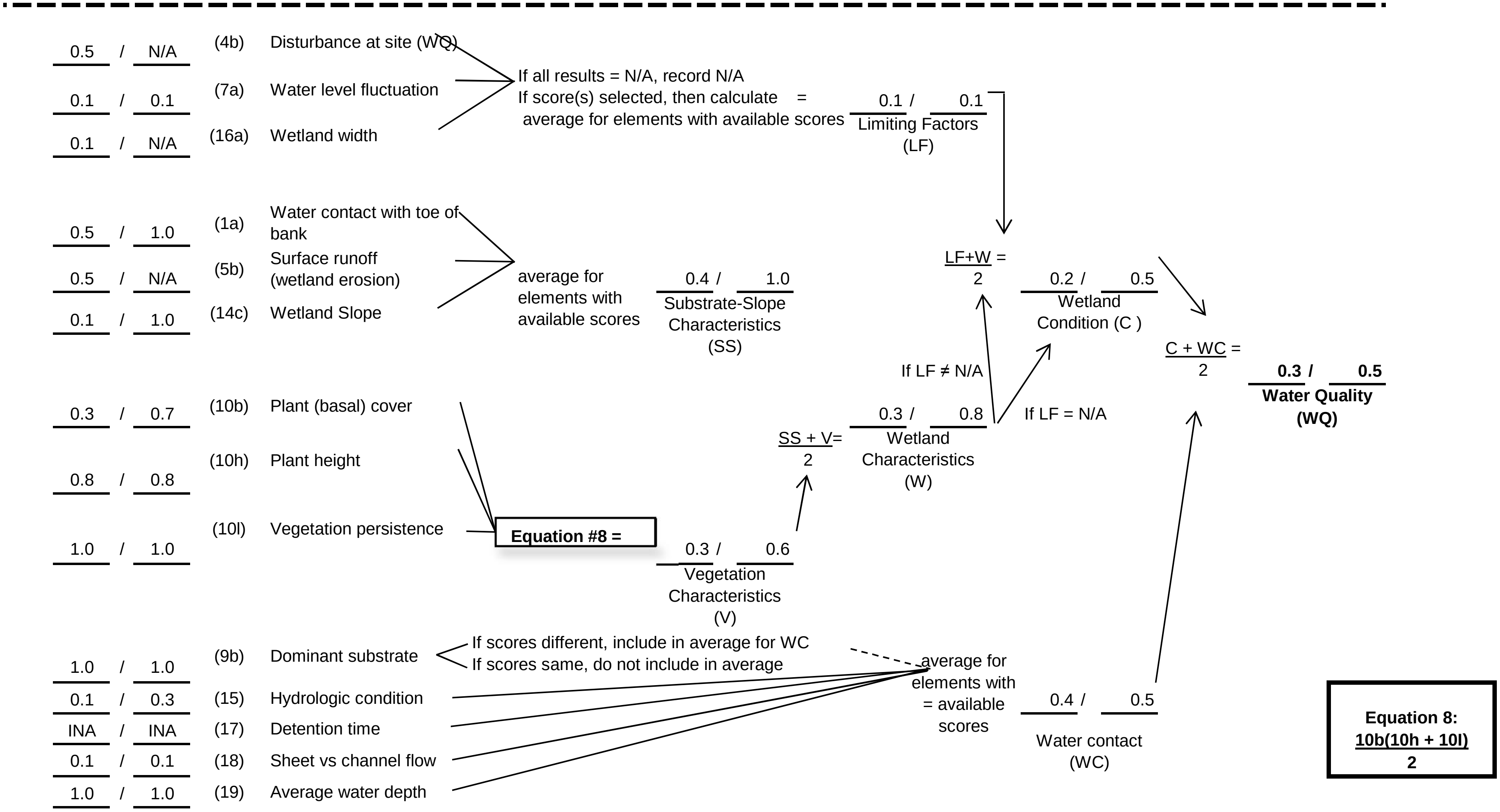
Selected Scores		(#)	Element

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

0.1 / 0.3 (15) Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.



0.5 / N/A (4b) Disturbance at site (WQ)

0.1 / 0.1 (7a) Water level fluctuation

0.1 / N/A (16a) Wetland width

If all results = N/A, record N/A

If score(s) selected, then calculate = average for elements with available scores

0.1 / 0.1 Limiting Factors (LF)

0.5 / 1.0 (1a) Water contact with toe of bank

0.5 / N/A (5b) Surface runoff (wetland erosion)

0.1 / 1.0 (14c) Wetland Slope

average for elements with available scores

0.4 / 1.0 Substrate-Slope Characteristics (SS)

0.3 / 0.7 (10b) Plant (basal) cover

0.8 / 0.8 (10h) Plant height

1.0 / 1.0 (10l) Vegetation persistence

Equation #8 =

0.3 / 0.6 Vegetation Characteristics (V)

SS + V= 2

0.3 / 0.8 Wetland Characteristics (W)

If LF ≠ N/A

LF+W = 2

If LF = N/A

0.2 / 0.5 Wetland Condition (C)

C + WC = 2

0.3 / 0.5

Water Quality (WQ)

1.0 / 1.0 (9b) Dominant substrate

If scores different, include in average for WC

If scores same, do not include in average

0.1 / 0.3 (15) Hydrologic condition

INA / INA (17) Detention time

0.1 / 0.1 (18) Sheet vs channel flow

1.0 / 1.0 (19) Average water depth

average for elements with = available scores

0.4 / 0.5 Water contact (WC)

Equation 8:

$\frac{10b(10h + 10l)}{2}$

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Wildlife

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
N/A / N/A	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
0.1 / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.3 / 0.3	(11b)	Condition of Layers
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees
0.1 / 0.2	(12a)	Cover types
0.1 / 0.1	(12b)	Ratio of cover types
0.1 / 0.5	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
0.1 / 0.5	(13a)	% open water
0.1 / 0.5	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
0.1 / 0.1	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / N/A Features Which Reduce Habitat Value (F)

(11a)–(11c): average for elements with available scores = 0.5 / 0.7 Vegetation Strata

(12a)–(12d): average for elements with available scores = 0.1 / 0.3 Vegetation Cover Types

(13a)–(13b): average for elements with available scores = 0.1 / 0.5 Vegetation/Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.2 / 0.4 Wildlife FCI**

If F = NA: **0.2 / 0.4 Wildlife FCI**

`

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores		(#)	Element

Comparison:______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

N/A	N/A	(24)	Obstruction to fish passage

if result = 0.1, STOP. There is no potential for providing tidal fish habitat

if result ≠ 0.1 or N/A, then continue with model

0.1	N/A	(1b)	Shoreline bank stability
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.367 / N/A Limiting Factors

0.5	1.0	(10m)	Vegetative overhang
0.7	0.7	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.5	0.5	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

0.5	1.5	(20b)	Water quality rating

If score available, record score for WQ

If information not available, continue

INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 1.5 Water Quality (WQ)

average for available scores = **0.5 / 0.9**

Fish (Non-Tidal Stream/River)

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Uniqueness/Heritage

Comparison: ______________ / ______________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores	(#)	Element
N/A / N/A	(29)	Endangered species
N/A / N/A	(30)	Rarity
N/A / N/A	(31)	Unique features
N/A / N/A	(32)	Historical or archaeological significance
N/A / N/A	(33)	Natural landmark
N/A / N/A	(34)	Connected to Wild and Scenic River
1.0 / 1.0	(35)	Park, sanctuary, etc.
N/A / N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Upland Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

E + I = / 2 ~~N/A~~ / ~~N/A~~

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):

~~If 10e not applicable:~~

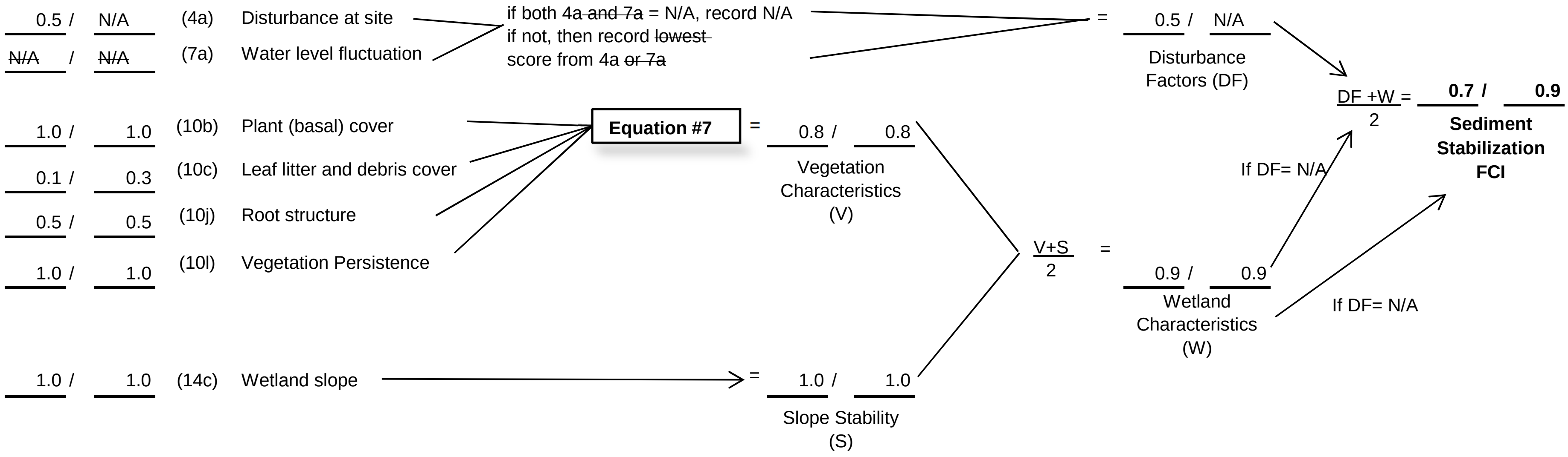
10a (~~10g +~~ 10i + 10k)

~~3~~2

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Sediment Stabilization (Upland)

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)



Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

if both 4a~~ and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~

= 0.5 / N/A
Disturbance Factors (DF)

Equation #7 = 0.8 / 0.8
Vegetation Characteristics (V)

= 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF+W}{2}$ = **0.7 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative B Year 50

Calculation of Wildlife (Upland)

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element
0.1 / 0.1	(4c)	Disturbance of wildlife habitat
N/A / N/A	(20a)	Gross contamination
N/A / N/A	(16b)	Wetland size
0.7 / 0.7	(11a)	Layers
0.7 / 0.7	(11b)	Condition of Layers
1.0 / 1.0	(11c)	Spatial pattern of shrubs/trees
0.2 / 0.2	(12a)	Cover types
0.5 / 0.5	(12b)	Ratio of cover types
0.5 / 1.0	(12c)	Cover type interspersion
N/A / N/A	(12d)	Undesirable species
~~N/A~~ / ~~N/A~~	(13a)	% open water
~~N/A~~ / ~~N/A~~	(13b)	Vegetation/water interspersion
0.1 / 0.1	(21a)	Shape of upland/wetland edge
N/A / N/A	(22a)	Wildlife attractors
~~N/A~~ / ~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ = **0.3 / 0.3**

If F = NA: **Wildlife FCI**

Wildlife FCI = **0.3 / 0.3**

Table A.1.
Comparison of WAA and planned wetland: calculations of FCIs and FCUs

Project Title: Site 854. Westchester County Center Alternative C Year 50

Comparison between WAA#______________________ and wetland # ______________________

Function	WAA			Goals for Planned Wetland**					Planned Wetland			Check if goals met
	FCI	AREA	FCUs*	Target FCI	R	Target FCUs	Predicted FCI	Minimum Area	FCI	Area	FCUs*	
SB	0.53	2.00	1.057	0.65	1	1.0567	0.65	1.6256	0.73	3.68	2.667	Y
SS	0.14	2.00	0.280	0.30	1	0.2800	0.30	0.9333	0.47	3.68	1.725	Y
WQ	0.30	2.00	0.609	0.45	1	0.6092	0.45	1.3537	0.41	3.68	1.508	Y
WL	0.15	2.00	0.304	0.20	1	0.3040	0.20	1.5201	0.24	3.68	0.887	Y
FS	0.45	2.00	0.900	0.65	1	0.9000	0.65	1.3846	0.86	3.68	3.168	Y
UH	1.00			1.00					1.00			Y

*FCUs = FCU x AREA
**Target FCI = *goal* established by decision makers
R = multiplying factor established by decision makers
Target FCUs = FCUWAA x R (i.e., planned wetland *goal*)
Predicted FCI = FCIs which designers presume planned wetland may achieve at a particular site (Note this may be greater than Target FCI)
Minimum Area = Target FCUs/Predicted FCI

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Shoreline Bank Erosion Control

Comparison:____ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
1.0	1.0	(2)	Fetch
1.0	1.0	(14a)	Steepness of existing shore

if result = 0.1 for either element, then the planned wetland site is UNSUITABLE

if result ≠ 0.1 for both elements, then continue with model

Selected Scores		(#)	Element
0.5 /	0.7	(1a)	Water contact with toe of bank

if result = N/A, then STOP: **Shoreline Bank Erosion Control FCI = N/A**

if other, record score

1a= 0.5 / 0.7

Potential for Erosion (E)

Selected Scores		(#)	Element
0.5	N/A	(3)	Shoreline structures/obstacles
1.0	1.0	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
N/A	N/A	(6)	Boat Traffic
0.1	N/A	(7a)	Water level fluctuation
0.5	0.5	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
N/A	N/A	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
0.1	0.5	(10e)	Rooted vascular aquatic beds
1.0	1.0	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

3= 0.5 / N/A

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / 0.8

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.7 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = 0.6 / 0.8

Influences on Rate of Erosion (I)

$\frac{E + I}{2}$ = **0.5 / 0.7**

Shoreline Bank Erosion Control FCI

Equation #5:
If 10e applicable:

$$\frac{10a\ (10g + 10i + 10k) + 10e}{4}$$

Equation #6:
If 10e not applicable:

$$\frac{10a\ (10g + 10i + 10k)}{3}$$

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Sediment Stabilization

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
0.1 /	0.1	(7a)	Water level fluctuation
0.3 /	0.7	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.8	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
0.1 /	1.0	(14c)	Wetland slope

if both 4a and 7a = N/A, record N/A
if not, then record lowest
score from 4a or 7a

= 0.1 / 0.1
Disturbance Factors (DF)

Equation #7 = 0.3 / 0.7
Vegetation Characteristics (V)

= 0.1 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.2 / 0.8
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.1 / 0.5**

Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Water Quality

Selected Scores			(#)	Element

Comparison:____________________ / ____________________ (e.g., WAA/planned wetland)

0.1	/	0.1	(15)	Hydrologic condition

if result = N/A , then STOP Water Quality FCI is not applicable

If score selected, then continue with model.

0.5	/	N/A	(4b)	Disturbance at site (WQ)
0.1	/	0.1	(7a)	Water level fluctuation
0.1	/	0.1	(16a)	Wetland width

If all results = N/A, record N/A
If score(s) selected, then calculate average for elements with available scores = 0.1 / 0.1 Limiting Factors (LF)

0.5	/	0.7	(1a)	Water contact with toe of bank
0.5	/	N/A	(5b)	Surface runoff (wetland erosion)
0.1	/	1.0	(14c)	Wetland Slope

average for elements with available scores 0.4 / 0.9 Substrate-Slope Characteristics (SS)

0.3	/	0.7	(10b)	Plant (basal) cover
0.8	/	0.8	(10h)	Plant height
1.0	/	1.0	(10l)	Vegetation persistence

Equation #8 = 0.3 / 0.6 Vegetation Characteristics (V)

$\frac{SS + V}{2}$ = 0.3 / 0.7 Wetland Characteristics (W)

If LF ≠ N/A: $\frac{LF+W}{2}$ = 0.2 / 0.4 Wetland Condition (C)

If LF = N/A: Wetland Condition (C)

1.0	/	1.0	(9b)	Dominant substrate
0.1	/	0.1	(15)	Hydrologic condition
INA	/	INA	(17)	Detention time
0.1	/	0.1	(18)	Sheet vs channel flow
1.0	/	1.0	(19)	Average water depth

If scores different, include in average for WC
If scores same, do not include in average

average for elements with available scores = 0.4 / 0.4 Water contact (WC)

$\frac{C + WC}{2}$ = **0.3 / 0.4 Water Quality (WQ)**

Equation 8:
$$\frac{10b(10h + 10l)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Wildlife

Comparison: ________________ / ________________ (e.g., WAA/planned wetland)

Selected Scores	(#)	Element		
N/A / N/A	(4c)	Disturbance of wildlife habitat	If 4c, 16b and 20a = N/A, record N/A If any score = 0.1, record 0.1	= 0.1 / 0.1 Features Which Reduce Habitat Value (F)
N/A / N/A	(20a)	Gross contamination		
0.1 / 0.1	(16b)	Wetland size		
0.7 / 0.7	(11a)	Layers	average for elements with available scores	= 0.5 / 0.7 Vegetation Strata
0.3 / 0.3	(11b)	Condition of Layers		
N/A / 1.0	(11c)	Spatial pattern of shrubs/trees		
0.1 / 0.2	(12a)	Cover types	average for elements with available scores	= 0.1 / 0.3 Vegetation Cover Types
0.1 / 0.1	(12b)	Ratio of cover types		
0.1 / 0.5	(12c)	Cover type interspersion		
N/A / N/A	(12d)	Undesirable species		
0.1 / 0.5	(13a)	% open water	average for elements with available scores	= 0.1 / 0.5 Vegetation/ Water Proportions
0.1 / 0.5	(13b)	Vegetation/water interspersion		
0.1 / 0.1	(21a)	Shape of upland/wetland edge	average for elements with available scores	= 0.1 / 0.1 Physical Features
N/A / N/A	(22a)	Wildlife attractors		
0.1 / 0.1	(23)	Islands		

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.2 / 0.4 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.2 / 0.2
Wildlife FCI

`

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Fish (Non-tidal Stream/River)

Selected Scores | (#) | Element | Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
N/A	N/A	(24)	Obstruction to fish passage

- if result = 0.1, STOP. There is no potential for providing tidal fish habitat
- if result ≠ 0.1 or N/A, then continue with model

Selected Scores		(#)	Element
0.1	N/A	(1b)	Shoreline bank stability
0.5	N/A	(4a)	Disturbance at site (SS)
0.5	N/A	(4d)	Disturbance in channel/open water
N/A	N/A	(16c)	Fish habitat size
N/A	N/A	(24)	Obstruction to fish passage

average for elements with available scores = 0.4 / N/A Limiting Factors

Selected Scores		(#)	Element
0.5	1.0	(10m)	Vegetative overhang
0.7	0.7	(10o)	Plant biomass
0.5	0.5	(21b)	Shape of wetland/water edge
0.3	0.3	(22b)	Available fish cover/attractors
0.5	0.5	(25a)	% pool area
0.1	0.5	(26)	Bank account

average for elements with available scores = 0.4 / 0.6 Food/Cover

Selected Scores		(#)	Element
N/A	N/A	(25b)	Current velocity within pools
0.5	0.5	(27a)	Spawning substrate
N/A	N/A	(27b)	Spawning structures

average for elements with available scores = 0.5 / 0.5 Reproduction

Selected Scores		(#)	Element
0.5	1.5	(20b)	Water quality rating

- If score available, record score for WQ
- If information not available, continue

Selected Scores		(#)	Element
INA	INA	(20c)	Nutrient/sediment/contaminant sources
INA	INA	(20d)	Dissolved Oxygen
INA	INA	(20e)	pH
INA	INA	(20f)	Maximum water temperature
INA	INA	(20g)	Turbidity

average for elements with available scores = 0.5 / 1.5 Water Quality (WQ)

average for available scores = **0.5 / 0.9**

Fish (Non-Tidal Stream/River)

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Uniqueness/Heritage

Comparison:________________ / ________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores			(#)	Element
N/A	/	N/A	(29)	Endangered species
N/A	/	N/A	(30)	Rarity
N/A	/	N/A	(31)	Unique features
N/A	/	N/A	(32)	Historical or archaeological significance
N/A	/	N/A	(33)	Natural landmark
N/A	/	N/A	(34)	Connected to Wild and Scenic River
1.0	/	1.0	(35)	Park, sanctuary, etc.
N/A	/	N/A	(36)	Scientific research site

average for elements with available scores = **1.0 / 1.0**

Uniqueness/ Heritage FCI

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Upland Erosion Control

Comparison:______________________________________ (e.g., WAA/planned wetland)

Site Suitability For Planned Wetland:

Selected Scores		(#)	Element
~~N/A~~	~~N/A~~	(2)	Fetch
~~N/A~~	~~N/A~~	(14a)	Steepness of existing shore

[redacted]

Selected Scores		(#)	Element
~~N/A~~ /	~~N/A~~	(1a)	Water contact with toe of bank
~~N/A~~	~~N/A~~	(3)	Shoreline structures/obstacles
~~N/A~~	~~N/A~~	(2)	Fetch
0.5	N/A	(4a)	Disturbance at site (SS)
N/A	N/A	(5a)	Surface runoff (bank erosion)
~~N/A~~	~~N/A~~	(6)	Boat Traffic
~~N/A~~	~~N/A~~	(7a)	Water level fluctuation
N/A	N/A	(8a)	Hours of sunlight
N/A	N/A	(9a)	Substrate suitability for vegetation
~~N/A~~	~~N/A~~	(14b)	Steepness of planned wetland shore
1.0	1.0	(10a)	Plant (basal) cover
~~N/A~~	~~N/A~~	(10e)	Rooted vascular aquatic beds
~~N/A~~	~~N/A~~	(10g)	Plant height
0.5	0.5	(10i)	Root structure
1.0	1.0	(10k)	Vegetation persistence

[redacted]

1a= ~~N/A~~ / ~~N/A~~

Potential for Erosion (E)

3= ~~N/A~~ / ~~N/A~~

Shoreline Structures /Obstacles

average for elements with available scores = 0.5 / N/A

Physical Influences on Rate of Erosion

Equation #5 or #6 = 0.8 / 0.8

Vegetation influences on Rate of Erosion

average for available scores = **0.6 / 0.8**

Influences on Rate of Erosion (I)

E + I = ~~N/A~~ / ~~N/A~~
2

Shoreline Bank Erosion Control FCI

[redacted]

Equation #6 (modified):
~~If 10e not applicable:~~
10a (~~10g +~~ 10i + 10k)
~~3~~2

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Sediment Stabilization (Upland)

Selected Scores		(#)	Element
0.5 /	N/A	(4a)	Disturbance at site
~~N/A~~ /	~~N/A~~	(7a)	Water level fluctuation
1.0 /	1.0	(10b)	Plant (basal) cover
0.1 /	0.3	(10c)	Leaf litter and debris cover
0.5 /	0.5	(10j)	Root structure
1.0 /	1.0	(10l)	Vegetation Persistence
1.0 /	1.0	(14c)	Wetland slope

Comparison:______________________________ / ______________________________ (e.g., WAA/planned wetland)

(4a), (7a): if both 4~~a and 7a~~ = N/A, record N/A
if not, then record ~~lowest~~
score from 4a ~~or 7a~~
= 0.5 / N/A
Disturbance Factors (DF)

(10b), (10c), (10j), (10l): **Equation #7** = 0.8 / 0.8
Vegetation Characteristics (V)

(14c): = 1.0 / 1.0
Slope Stability (S)

$\frac{V+S}{2}$ = 0.9 / 0.9
Wetland Characteristics (W)

If DF= N/A

If DF= N/A

$\frac{DF + W}{2}$ = **0.7 / 0.9**
Sediment Stabilization FCI

Equation #7:

$$\frac{10b\ (10j + 10l) + 10c\ (1-10b)}{2}$$

Project Title: Site 854. Westchester County Center Alternative C Year 50

Calculation of Wildlife (Upland)

Comparison:________________________________ / ________________________________ (e.g., WAA/planned wetland)

Selected Scores		(#)	Element
0.1	0.1	(4c)	Disturbance of wildlife habitat
N/A	N/A	(20a)	Gross contamination
N/A	N/A	(16b)	Wetland size
0.7	0.7	(11a)	Layers
0.7	0.7	(11b)	Condition of Layers
1.0	1.0	(11c)	Spatial pattern of shrubs/trees
0.2	0.2	(12a)	Cover types
0.5	0.5	(12b)	Ratio of cover types
0.5	1.0	(12c)	Cover type interspersion
N/A	N/A	(12d)	Undesirable species
~~N/A~~	~~N/A~~	(13a)	% open water
~~N/A~~	~~N/A~~	(13b)	Vegetation/water interspersion
0.1	0.1	(21a)	Shape of upland/wetland edge
N/A	N/A	(22a)	Wildlife attractors
~~N/A~~	~~N/A~~	(23)	Islands

(4c), (20a), (16b): If 4c, 16b and 20a = N/A, record N/A. If any score = 0.1, record 0.1 = 0.1 / 0.1 Features Which Reduce Habitat Value (F)

(11a), (11b), (11c): average for elements with available scores = 0.8 / 0.8 Vegetation Strata

(12a), (12b), (12c), (12d): average for elements with available scores = 0.4 / 0.6 Vegetation Cover Types

(13a), (13b): average for elements with available scores = ~~N/A~~ / ~~N/A~~ Vegetation/ Water Proportions

(21a), (22a), (23): average for elements with available scores = 0.1 / 0.1 Physical Features

Vegetation Strata, Vegetation Cover Types, Vegetation/Water Proportions, Physical Features: average for available scores = 0.4 / 0.5 Habitat Complexity (HC)

If F ≠ NA: $\frac{F + HC}{2}$ =

If F = NA:

0.3 / 0.3
Wildlife FCI

Attachment B
AAFCU Scores

Site 860. River Park/West Farm Rapids Park

Average Annualized FCUs - Bronx River Park

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.66	0.00	0.002	0.35	0.120	0.060	0.35	2.280	0.114	0.33	5.587	0.112
	SS	0.51	0.00	0.002	0.35	0.108	0.054	0.35	2.044	0.102	0.33	5.011	0.100
	WQ	0.40	0.00	0.001	0.35	0.077	0.039	0.35	1.471	0.074	0.33	3.606	0.072
	WL	0.11	0.00	0.000	0.35	0.027	0.014	0.35	0.513	0.026	0.33	1.258	0.025
	FS	0.26	0.00	0.001	0.35	0.077	0.038	0.35	1.458	0.073	0.33	3.575	0.071
Alt B	SB	0.66	0.00	0.002	0.35	0.119	0.060	0.35	2.267	0.113	0.33	5.557	0.111
	SS	0.51	0.00	0.002	0.35	0.108	0.054	0.35	2.044	0.102	0.33	5.011	0.100
	WQ	0.40	0.00	0.001	0.35	0.077	0.039	0.35	1.471	0.074	0.33	3.606	0.072
	WL	0.11	0.00	0.000	0.35	0.027	0.013	0.35	0.510	0.026	0.33	1.250	0.025
	FS	0.26	0.00	0.001	0.35	0.077	0.038	0.35	1.458	0.073	0.33	3.575	0.071
Alt C	SB	0.66	0.00	0.002	0.07	0.024	0.012	0.07	0.456	0.023	0.06	1.121	0.022
	SS	0.51	0.00	0.002	0.07	0.018	0.009	0.07	0.347	0.017	0.06	0.853	0.017
	WQ	0.40	0.00	0.001	0.07	0.013	0.007	0.07	0.249	0.012	0.06	0.664	0.013
	WL	0.11	0.00	0.000	0.07	0.005	0.003	0.07	0.096	0.005	0.06	0.235	0.005
	FS	0.26	0.00	0.001	0.07	0.013	0.007	0.07	0.252	0.013	0.06	0.617	0.012

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval;   T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 861. Bronx Zoo and Dam

Average Annualized FCUs - Bronx Zoo

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.35	0.43	0.152	1.45	0.431	0.216	1.45	8.194	0.410	1.38	20.292	0.406
	SS	0.63	0.43	0.271	1.45	0.711	0.355	1.45	13.502	0.675	1.38	33.449	0.669
	WQ	0.36	0.43	0.153	1.45	0.377	0.188	1.45	7.159	0.358	1.38	17.741	0.355
	WL	0.22	0.43	0.095	1.45	0.274	0.137	1.45	5.211	0.261	1.38	12.903	0.258
	FS	0.37	0.43	0.159	1.45	0.371	0.186	1.45	7.055	0.353	1.38	17.486	0.350
Alt B	SB	0.35	0.43	0.152	1.17	0.360	0.180	1.17	6.845	0.342	1.11	16.986	0.340
	SS	0.63	0.43	0.271	1.17	0.602	0.301	1.17	11.441	0.572	1.11	28.400	0.568
	WQ	0.36	0.43	0.153	1.17	0.320	0.160	1.17	6.074	0.304	1.11	15.082	0.302
	WL	0.22	0.43	0.095	1.17	0.195	0.097	1.17	3.704	0.185	1.11	9.198	0.184
	FS	0.37	0.43	0.159	1.17	0.315	0.158	1.17	5.992	0.300	1.11	14.883	0.298
Alt C	SB	0.35	0.43	0.15	0.97	0.247	0.123	0.97	4.685	0.234	0.92	11.663	0.233
	SS	0.63	0.43	0.27	0.97	0.495	0.248	0.97	9.405	0.470	0.92	23.399	0.468
	WQ	0.36	0.43	0.15	0.97	0.274	0.137	0.97	5.203	0.260	0.92	12.946	0.259
	WL	0.22	0.43	0.09	0.97	0.166	0.083	0.97	3.109	0.155	0.92	7.825	0.157
	FS	0.37	0.43	0.16	0.97	0.266	0.133	0.97	5.063	0.253	0.92	12.603	0.252

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 863. Stone Mill Dam

Average Annualized FCUs - Stone Mill Dam

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
Alt B	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
Alt C	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 113. Shoelace Park

Average Annualized FCUs - Shoelace Park.

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.32	0.02	0.006	2.98	0.857	0.429	2.99	16.369	0.818	2.84	40.114	0.802
	SS	0.16	0.02	0.003	2.98	0.934	0.467	2.99	17.827	0.891	2.84	43.685	0.874
	WQ	0.28	0.02	0.006	2.98	0.540	0.270	2.99	10.315	0.516	2.84	25.280	0.506
	WL	0.15	0.02	0.003	2.98	0.346	0.173	2.99	6.614	0.331	2.84	15.229	0.305
	FS	0.35	0.02	0.007	2.98	0.873	0.437	2.99	16.669	0.833	2.84	40.850	0.817
Alt B	SB	0.32	0.02	0.006	0.22	0.069	0.034	0.43	2.458	0.123	0.41	6.033	0.121
	SS	0.16	0.02	0.003	0.22	0.073	0.036	0.43	2.624	0.131	0.41	6.438	0.129
	WQ	0.28	0.02	0.006	0.22	0.043	0.022	0.43	1.534	0.077	0.41	3.765	0.075
	WL	0.15	0.02	0.003	0.22	0.025	0.012	0.43	0.887	0.044	0.41	2.077	0.042
	FS	0.35	0.02	0.007	0.22	0.052	0.026	0.43	1.866	0.093	0.41	4.734	0.095
Alt C	SB	0.32	0.02	0.006	0.21	0.057	0.029	0.41	2.092	0.105	0.39	5.134	0.103
	SS	0.16	0.02	0.003	0.21	0.041	0.020	0.41	1.506	0.075	0.39	3.695	0.074
	WQ	0.28	0.02	0.006	0.21	0.035	0.018	0.41	1.285	0.064	0.39	3.155	0.063
	WL	0.15	0.02	0.003	0.21	0.023	0.012	0.41	0.852	0.043	0.39	1.994	0.040
	FS	0.35	0.02	0.007	0.21	0.049	0.024	0.41	1.769	0.088	0.39	4.180	0.084

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 862. Muskrat Cove

Average Annualized FCUs - Muskrat Cove

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.55	0.02	0.011	0.63	0.220	0.110	0.67	4.415	0.221	0.64	10.831	0.217
	SS	0.53	0.02	0.011	0.63	0.201	0.101	0.67	4.043	0.202	0.64	9.920	0.198
	WQ	0.34	0.02	0.007	0.63	0.119	0.059	0.67	2.386	0.119	0.64	5.854	0.117
	WL	0.11	0.02	0.002	0.63	0.061	0.030	0.67	1.223	0.061	0.64	2.999	0.060
	FS	0.44	0.02	0.009	0.63	0.167	0.084	0.67	3.356	0.168	0.64	8.234	0.165
Alt B	SB	0.55	0.02	0.011	0.63	0.220	0.110	0.67	4.415	0.221	0.64	10.831	0.217
	SS	0.53	0.02	0.011	0.63	0.201	0.101	0.67	4.043	0.202	0.64	9.920	0.198
	WQ	0.34	0.02	0.007	0.63	0.136	0.068	0.67	2.724	0.136	0.64	6.684	0.134
	WL	0.11	0.02	0.002	0.63	0.053	0.026	0.67	1.061	0.053	0.64	2.604	0.052
	FS	0.44	0.02	0.009	0.63	0.167	0.084	0.67	3.356	0.168	0.64	8.234	0.165
Alt C	SB	0.55	0.02	0.011	0.04	0.016	0.008	0.07	0.509	0.025	0.07	1.261	0.025
	SS	0.53	0.02	0.011	0.04	0.017	0.009	0.07	0.541	0.027	0.07	1.340	0.027
	WQ	0.34	0.02	0.007	0.04	0.010	0.005	0.07	0.316	0.016	0.07	0.783	0.016
	WL	0.11	0.02	0.002	0.04	0.004	0.002	0.07	0.140	0.007	0.07	0.346	0.007
	FS	0.44	0.02	0.009	0.04	0.013	0.006	0.07	0.397	0.020	0.07	0.983	0.020

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 851. Bronxville Lake

Average Annualized FCUs - Bronxville

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.54	0.30	0.162	4.92	2.045	1.023	4.92	38.858	1.943	4.68	95.447	1.909
	SS	0.53	0.30	0.159	4.92	1.866	0.933	4.92	35.456	1.773	4.68	87.096	1.742
	WQ	0.51	0.30	0.154	4.92	1.888	0.944	4.92	35.873	1.794	4.68	88.116	1.762
	WL	0.23	0.30	0.070	4.92	0.909	0.455	4.92	17.279	0.864	4.68	42.442	0.849
	FS	0.43	0.30	0.128	4.92	1.293	0.647	4.92	24.569	1.228	4.68	60.364	1.207
Alt B	SB	0.54	0.30	0.162	3.57	1.494	0.747	3.57	28.391	1.420	3.39	69.801	1.396
	SS	0.53	0.30	0.159	3.57	1.388	0.694	3.57	26.365	1.318	3.39	64.825	1.296
	WQ	0.51	0.30	0.154	3.57	1.348	0.674	3.57	25.604	1.280	3.39	62.953	1.259
	WL	0.23	0.30	0.070	3.57	0.667	0.334	3.57	12.680	0.634	3.39	31.174	0.623
	FS	0.43	0.30	0.128	3.57	0.822	0.411	3.57	15.618	0.781	3.39	38.421	0.768
Alt C	SB	0.54	0.30	0.162	1.01	0.433	0.217	1.01	8.232	0.412	0.96	20.391	0.408
	SS	0.53	0.30	0.159	1.01	0.364	0.182	1.01	6.913	0.346	0.96	17.138	0.343
	WQ	0.51	0.30	0.154	1.01	0.368	0.184	1.01	6.998	0.350	0.96	17.344	0.347
	WL	0.23	0.30	0.070	1.01	0.204	0.102	1.01	3.881	0.194	0.96	9.610	0.192
	FS	0.43	0.30	0.128	1.01	0.343	0.171	1.01	6.512	0.326	0.96	16.132	0.323

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 852. Crestwood Lake

Average Annualized FCUs - Crestwood Lake

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.85	2.00	1.700	6.28	3.762	1.881	6.28	71.473	3.574	5.97	177.274	3.545
	SS	0.57	2.00	1.130	6.28	3.073	1.537	6.28	58.392	2.920	5.97	144.691	2.894
	WQ	0.57	2.00	1.142	6.28	2.944	1.472	6.28	55.930	2.797	5.97	138.623	2.772
	WL	0.35	2.00	0.696	6.28	2.064	1.032	6.28	39.216	1.961	5.97	97.141	1.943
	FS	0.36	2.00	0.717	6.28	2.245	1.123	6.28	42.660	2.133	5.97	105.651	2.113
Alt B	SB	0.85	2.00	1.700	2.44	2.001	1.000	2.44	38.019	1.901	2.32	95.310	1.906
	SS	0.57	2.00	1.130	2.44	1.540	0.770	2.44	29.268	1.463	2.32	73.295	1.466
	WQ	0.57	2.00	1.142	2.44	1.323	0.662	2.44	25.141	1.257	2.32	63.033	1.261
	WL	0.35	2.00	0.696	2.44	0.772	0.386	2.44	14.667	0.733	2.32	36.786	0.736
	FS	0.36	2.00	0.717	2.44	0.824	0.412	2.44	15.654	0.783	2.32	39.250	0.785
Alt C	SB	0.85	2.00	1.70	1.79	1.711	0.856	1.79	32.515	1.626	1.70	81.831	1.637
	SS	0.57	2.00	1.13	1.79	1.165	0.582	1.79	22.133	1.107	1.70	55.691	1.114
	WQ	0.57	2.00	1.14	1.79	1.082	0.541	1.79	20.559	1.028	1.70	51.767	1.035
	WL	0.35	2.00	0.70	1.79	0.661	0.331	1.79	12.564	0.628	1.70	31.635	0.633
	FS	0.36	2.00	0.72	1.79	0.801	0.401	1.79	15.225	0.761	1.70	38.286	0.766

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 853. Garth Woods and Harney Road

Average Annualized FCUs - Garth

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.46	0.20	0.092	0.26	0.133	0.067	0.26	2.534	0.127	0.25	6.340	0.127
	SS	0.10	0.20	0.020	0.26	0.033	0.016	0.26	0.627	0.031	0.25	4.151	0.083
	WQ	0.44	0.20	0.088	0.26	0.121	0.060	0.26	2.296	0.115	0.25	5.744	0.115
	WL	0.23	0.20	0.046	0.26	0.074	0.037	0.26	1.519	0.076	0.25	3.795	0.076
	FS	0.39	0.20	0.078	0.26	0.090	0.045	0.26	1.711	0.086	0.25	4.288	0.086

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Average Annualized FCUs - Harney Road

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.55	0.60	0.332	1.62	0.857	0.428	1.62	16.275	0.814	1.53	40.373	0.807
	SS	0.11	0.60	0.066	1.62	0.535	0.268	1.62	10.171	0.509	1.53	25.157	0.503
	WQ	0.28	0.60	0.165	1.62	0.570	0.285	1.62	10.823	0.541	1.53	26.820	0.536
	WL	0.17	0.60	0.104	1.62	0.327	0.164	1.62	6.214	0.311	1.53	15.403	0.308
	FS	0.43	0.60	0.260	1.62	0.622	0.311	1.62	11.817	0.591	1.53	29.324	0.586
Alt B	SB	0.55	0.60	0.332	1.02	0.535	0.268	1.02	10.167	0.508	0.97	25.364	0.507
	SS	0.11	0.60	0.066	1.02	0.421	0.211	1.02	8.005	0.400	0.97	19.878	0.398
	WQ	0.28	0.60	0.165	1.02	0.343	0.171	1.02	6.516	0.326	0.97	16.233	0.325
	WL	0.17	0.60	0.104	1.02	0.233	0.116	1.02	4.425	0.221	0.97	11.019	0.220
	FS	0.43	0.60	0.260	1.02	0.533	0.267	1.02	10.128	0.506	0.97	25.235	0.505
Alt C	SB	0.55	0.60	0.332	1.02	0.535	0.267	1.02	10.163	0.508	0.97	25.354	0.507
	SS	0.11	0.60	0.066	1.02	0.342	0.171	1.02	6.501	0.325	0.97	16.150	0.323
	WQ	0.28	0.60	0.165	1.02	0.338	0.169	1.02	6.430	0.321	0.97	16.020	0.320
	WL	0.17	0.60	0.104	1.02	0.196	0.098	1.02	4.046	0.202	0.97	10.081	0.202
	FS	0.43	0.60	0.260	1.02	0.448	0.224	1.02	8.504	0.425	0.97	21.207	0.424

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 854. Westchester County Center

Average Annualized FCUs - Westchester County

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.53	2.00	1.057	5.36	2.706	1.353	5.36	51.412	2.571	5.09	127.546	2.551
	SS	0.14	2.00	0.280	5.36	2.233	1.116	5.36	42.418	2.121	5.09	104.930	2.099
	WQ	0.30	2.00	0.609	5.36	1.768	0.884	5.36	33.601	1.680	5.09	83.318	1.666
	WL	0.15	2.00	0.304	5.36	1.356	0.678	5.36	25.772	1.289	5.09	63.821	1.276
	FS	0.45	2.00	0.900	5.36	2.174	1.087	5.36	41.313	2.066	5.09	102.519	2.050
Alt B	SB	0.53	2.00	1.057	3.89	2.153	1.076	3.90	40.948	2.047	3.70	101.916	2.038
	SS	0.14	2.00	0.280	3.89	1.550	0.775	3.90	29.489	1.474	3.70	73.160	1.463
	WQ	0.30	2.00	0.609	3.89	1.151	0.575	3.90	21.892	1.095	3.70	54.509	1.090
	WL	0.15	2.00	0.304	3.89	0.823	0.412	3.90	15.659	0.783	3.70	38.924	0.778
	FS	0.45	2.00	0.900	3.89	1.996	0.998	3.90	37.976	1.899	3.70	94.479	1.890
Alt C	SB	0.53	2.00	1.057	3.86	1.868	0.934	3.87	35.545	1.777	3.68	88.540	1.771
	SS	0.14	2.00	0.280	3.86	0.944	0.472	3.87	17.956	0.898	3.68	44.603	0.892
	WQ	0.30	2.00	0.609	3.86	1.064	0.532	3.87	20.246	1.012	3.68	50.435	1.009
	WL	0.15	2.00	0.304	3.86	0.590	0.295	3.87	11.228	0.561	3.68	27.955	0.559
	FS	0.45	2.00	0.900	3.86	1.986	0.993	3.87	37.792	1.890	3.68	94.030	1.881

For Year 20, it was assumed that stabilized banks would contain 10 percent more wetlands than Year 1.
For Year 50, it was assumed that all wetlands would realize a 5 percent loss due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

No Action Alternative AAFCU Score

Site 860. River Park/West Farm Rapids Park

Average Annualized FCUs - River Park/West Farm Rapids Park
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.66	0.00	0.002	0.00	0.001	0.000	0.00	0.019	0.001	0.00	0.049	0.001
	SS	0.51	0.00	0.002	0.00	0.001	0.000	0.00	0.015	0.001	0.00	0.038	0.001
	WQ	0.35	0.00	0.001	0.00	0.001	0.000	0.00	0.010	0.001	0.00	0.026	0.001
	WL	0.11	0.00	0.000	0.00	0.000	0.000	0.00	0.003	0.000	0.00	0.008	0.000
	FS	0.26	0.00	0.001	0.00	0.000	0.000	0.00	0.007	0.000	0.00	0.019	0.000
Alt B	SB	0.66	0.00	0.002	0.00	0.001	0.000	0.00	0.019	0.001	0.00	0.049	0.001
	SS	0.51	0.00	0.002	0.00	0.001	0.000	0.00	0.015	0.001	0.00	0.038	0.001
	WQ	0.35	0.00	0.001	0.00	0.001	0.000	0.00	0.010	0.001	0.00	0.026	0.001
	WL	0.11	0.00	0.000	0.00	0.000	0.000	0.00	0.003	0.000	0.00	0.008	0.000
	FS	0.26	0.00	0.001	0.00	0.000	0.000	0.00	0.007	0.000	0.00	0.019	0.000
Alt C	SB	0.66	0.00	0.002	0.00	0.001	0.000	0.00	0.019	0.001	0.00	0.049	0.001
	SS	0.51	0.00	0.002	0.00	0.001	0.000	0.00	0.015	0.001	0.00	0.038	0.001
	WQ	0.35	0.00	0.001	0.00	0.001	0.000	0.00	0.010	0.001	0.00	0.026	0.001
	WL	0.11	0.00	0.000	0.00	0.000	0.000	0.00	0.003	0.000	0.00	0.008	0.000
	FS	0.26	0.00	0.001	0.00	0.000	0.000	0.00	0.007	0.000	0.00	0.019	0.000

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 861. Bronx Zoo and Dam

Average Annualized FCUs - Bronx Zoo
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.35	0.43	0.152	0.43	0.152	0.076	0.41	2.813	0.141	0.39	7.068	0.141
	SS	0.63	0.43	0.271	0.43	0.271	0.135	0.41	5.018	0.251	0.39	12.610	0.252
	WQ	0.36	0.43	0.153	0.43	0.153	0.077	0.41	2.838	0.142	0.39	7.131	0.143
	WL	0.22	0.43	0.095	0.43	0.095	0.047	0.41	1.754	0.088	0.39	4.409	0.088
	FS	0.37	0.43	0.159	0.43	0.159	0.080	0.41	2.954	0.148	0.39	7.423	0.148
Alt B	SB	0.35	0.43	0.152	0.43	0.152	0.076	0.41	2.813	0.141	0.39	7.068	0.141
	SS	0.63	0.43	0.271	0.43	0.271	0.135	0.41	5.018	0.251	0.39	12.610	0.252
	WQ	0.36	0.43	0.153	0.43	0.153	0.077	0.41	2.838	0.142	0.39	7.131	0.143
	WL	0.22	0.43	0.095	0.43	0.095	0.047	0.41	1.754	0.088	0.39	4.409	0.088
	FS	0.37	0.43	0.159	0.43	0.159	0.080	0.41	2.954	0.148	0.39	7.423	0.148
Alt C	SB	0.35	0.43	0.15	0.43	0.152	0.076	0.41	2.813	0.141	0.39	7.068	0.141
	SS	0.63	0.43	0.27	0.43	0.271	0.135	0.41	5.018	0.251	0.39	12.610	0.252
	WQ	0.36	0.43	0.15	0.43	0.153	0.077	0.41	2.838	0.142	0.39	7.131	0.143
	WL	0.22	0.43	0.09	0.43	0.095	0.047	0.41	1.754	0.088	0.39	4.409	0.088
	FS	0.37	0.43	0.16	0.43	0.159	0.080	0.41	2.954	0.148	0.39	7.423	0.148

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 863. Stone Mill Dam

Average Annualized FCUs - Stone Mill Dam
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
Alt B	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
Alt C	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 113. Shoelace Park

Average Annualized FCUs - Shoelace Park
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.30	0.02	0.006	0.02	0.006	0.003	0.02	0.110	0.006	0.02	0.277	0.006
	SS	0.16	0.02	0.003	0.02	0.003	0.002	0.02	0.059	0.003	0.02	0.148	0.003
	WQ	0.28	0.02	0.006	0.02	0.006	0.003	0.02	0.105	0.005	0.02	0.263	0.005
	WL	0.15	0.02	0.003	0.02	0.003	0.001	0.02	0.055	0.003	0.02	0.139	0.003
	FS	0.35	0.02	0.007	0.02	0.007	0.004	0.02	0.130	0.006	0.02	0.326	0.007
Alt B	SB	0.30	0.02	0.006	0.02	0.006	0.003	0.02	0.110	0.006	0.02	0.277	0.006
	SS	0.16	0.02	0.003	0.02	0.003	0.002	0.02	0.059	0.003	0.02	0.148	0.003
	WQ	0.28	0.02	0.006	0.02	0.006	0.003	0.02	0.105	0.005	0.02	0.263	0.005
	WL	0.15	0.02	0.003	0.02	0.003	0.001	0.02	0.055	0.003	0.02	0.139	0.003
	FS	0.35	0.02	0.007	0.02	0.007	0.004	0.02	0.130	0.006	0.02	0.326	0.007
Alt C	SB	0.30	0.02	0.006	0.02	0.006	0.003	0.02	0.110	0.006	0.02	0.277	0.006
	SS	0.16	0.02	0.003	0.02	0.003	0.002	0.02	0.059	0.003	0.02	0.148	0.003
	WQ	0.28	0.02	0.006	0.02	0.006	0.003	0.02	0.105	0.005	0.02	0.263	0.005
	WL	0.15	0.02	0.003	0.02	0.003	0.001	0.02	0.055	0.003	0.02	0.139	0.003
	FS	0.35	0.02	0.007	0.02	0.007	0.004	0.02	0.130	0.006	0.02	0.326	0.007

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 862. Muskrat Cove

Average Annualized FCUs - Muskrat Cove
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.55	0.02	0.011	0.02	0.011	0.005	0.02	0.203	0.010	0.02	0.510	0.010
	SS	0.53	0.02	0.011	0.02	0.011	0.005	0.02	0.195	0.010	0.02	0.491	0.010
	WQ	0.34	0.02	0.007	0.02	0.007	0.003	0.02	0.124	0.006	0.02	0.312	0.006
	WL	0.11	0.02	0.002	0.02	0.002	0.001	0.02	0.041	0.002	0.02	0.102	0.002
	FS	0.44	0.02	0.009	0.02	0.009	0.004	0.02	0.164	0.008	0.02	0.411	0.008
Alt B	SB	0.55	0.02	0.011	0.02	0.011	0.005	0.02	0.203	0.010	0.02	0.510	0.010
	SS	0.53	0.02	0.011	0.02	0.011	0.005	0.02	0.195	0.010	0.02	0.491	0.010
	WQ	0.34	0.02	0.007	0.02	0.007	0.003	0.02	0.124	0.006	0.02	0.312	0.006
	WL	0.11	0.02	0.002	0.02	0.002	0.001	0.02	0.041	0.002	0.02	0.102	0.002
	FS	0.44	0.02	0.009	0.02	0.009	0.004	0.02	0.164	0.008	0.02	0.411	0.008
Alt C	SB	0.55	0.02	0.011	0.02	0.011	0.005	0.02	0.203	0.010	0.02	0.510	0.010
	SS	0.53	0.02	0.011	0.02	0.011	0.005	0.02	0.195	0.010	0.02	0.491	0.010
	WQ	0.34	0.02	0.007	0.02	0.007	0.003	0.02	0.124	0.006	0.02	0.312	0.006
	WL	0.11	0.02	0.002	0.02	0.002	0.001	0.02	0.041	0.002	0.02	0.102	0.002
	FS	0.44	0.02	0.009	0.02	0.009	0.004	0.02	0.164	0.008	0.02	0.411	0.008

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 851. Bronxville Lake

Average Annualized FCUs - Bronxville
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.54	0.30	0.162	0.30	0.162	0.081	0.29	2.993	0.150	0.27	7.521	0.150
	SS	0.53	0.30	0.159	0.30	0.159	0.080	0.29	2.945	0.147	0.27	7.401	0.148
	WQ	0.51	0.30	0.154	0.30	0.154	0.077	0.29	2.848	0.142	0.27	7.157	0.143
	WL	0.23	0.30	0.070	0.30	0.070	0.035	0.29	1.293	0.065	0.27	3.250	0.065
	FS	0.43	0.30	0.128	0.30	0.128	0.064	0.29	2.362	0.118	0.27	5.935	0.119
Alt B	SB	0.54	0.30	0.162	0.30	0.162	0.081	0.29	2.993	0.150	0.27	7.521	0.150
	SS	0.53	0.30	0.159	0.30	0.159	0.080	0.29	2.945	0.147	0.27	7.401	0.148
	WQ	0.51	0.30	0.154	0.30	0.154	0.077	0.29	2.848	0.142	0.27	7.157	0.143
	WL	0.23	0.30	0.070	0.30	0.070	0.035	0.29	1.293	0.065	0.27	3.250	0.065
	FS	0.43	0.30	0.128	0.30	0.128	0.064	0.29	2.362	0.118	0.27	5.935	0.119
Alt C	SB	0.54	0.30	0.162	0.30	0.162	0.081	0.29	2.993	0.150	0.27	7.521	0.150
	SS	0.53	0.30	0.159	0.30	0.159	0.080	0.29	2.945	0.147	0.27	7.401	0.148
	WQ	0.51	0.30	0.154	0.30	0.154	0.077	0.29	2.848	0.142	0.27	7.157	0.143
	WL	0.23	0.30	0.070	0.30	0.070	0.035	0.29	1.293	0.065	0.27	3.250	0.065
	FS	0.43	0.30	0.128	0.30	0.128	0.064	0.29	2.362	0.118	0.27	5.935	0.119

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 852. Crestwood Lake

Average Annualized FCUs - Crestwood Lake

No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.85	2.00	1.700	2.00	1.700	0.850	1.90	31.493	1.575	1.80	79.135	1.583
	SS	0.57	2.00	1.130	2.00	1.130	0.565	1.90	20.933	1.047	1.80	52.602	1.052
	WQ	0.57	2.00	1.142	2.00	1.142	0.571	1.90	21.149	1.057	1.80	53.145	1.063
	WL	0.35	2.00	0.696	2.00	0.696	0.348	1.90	12.887	0.644	1.80	32.384	0.648
	FS	0.36	2.00	0.717	2.00	0.717	0.358	1.90	13.276	0.664	1.80	33.361	0.667
Alt B	SB	0.85	2.00	1.700	2.00	1.700	0.850	1.90	31.493	1.575	1.80	79.135	1.583
	SS	0.57	2.00	1.130	2.00	1.130	0.565	1.90	20.933	1.047	1.80	52.602	1.052
	WQ	0.57	2.00	1.142	2.00	1.142	0.571	1.90	21.149	1.057	1.80	53.145	1.063
	WL	0.35	2.00	0.696	2.00	0.696	0.348	1.90	12.887	0.644	1.80	32.384	0.648
	FS	0.36	2.00	0.717	2.00	0.717	0.358	1.90	13.276	0.664	1.80	33.361	0.667
Alt C	SB	0.85	2.00	1.70	2.00	1.700	0.850	1.90	31.493	1.575	1.80	79.135	1.583
	SS	0.57	2.00	1.13	2.00	1.130	0.565	1.90	20.933	1.047	1.80	52.602	1.052
	WQ	0.57	2.00	1.14	2.00	1.142	0.571	1.90	21.149	1.057	1.80	53.145	1.063
	WL	0.35	2.00	0.70	2.00	0.696	0.348	1.90	12.887	0.644	1.80	32.384	0.648
	FS	0.36	2.00	0.72	2.00	0.717	0.358	1.90	13.276	0.664	1.80	33.361	0.667

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 853. Garth Woods and Harney Road

Average Annualized FCUs - Harney Road
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.55	0.60	0.332	0.60	0.332	0.166	0.57	6.148	0.307	0.54	15.449	0.309
	SS	0.11	0.60	0.066	0.60	0.066	0.033	0.57	1.223	0.061	0.54	3.072	0.061
	WQ	0.28	0.60	0.165	0.60	0.165	0.083	0.57	3.057	0.153	0.54	7.681	0.154
	WL	0.17	0.60	0.104	0.60	0.104	0.052	0.57	1.921	0.096	0.54	4.827	0.097
	FS	0.43	0.60	0.260	0.60	0.260	0.130	0.57	4.817	0.241	0.54	12.103	0.242
Alt B	SB	0.55	0.60	0.332	0.60	0.332	0.166	0.57	6.148	0.307	0.54	15.449	0.309
	SS	0.11	0.60	0.066	0.60	0.066	0.033	0.57	1.223	0.061	0.54	3.072	0.061
	WQ	0.28	0.60	0.165	0.60	0.165	0.083	0.57	3.057	0.153	0.54	7.681	0.154
	WL	0.17	0.60	0.104	0.60	0.104	0.052	0.57	1.921	0.096	0.54	4.827	0.097
	FS	0.43	0.60	0.260	0.60	0.260	0.130	0.57	4.817	0.241	0.54	12.103	0.242
Alt C	SB	0.55	0.60	0.332	0.60	0.332	0.166	0.57	6.148	0.307	0.54	15.449	0.309
	SS	0.11	0.60	0.066	0.60	0.066	0.033	0.57	1.223	0.061	0.54	3.072	0.061
	WQ	0.28	0.60	0.165	0.60	0.165	0.083	0.57	3.057	0.153	0.54	7.681	0.154
	WL	0.17	0.60	0.104	0.60	0.104	0.052	0.57	1.921	0.096	0.54	4.827	0.097
	FS	0.43	0.60	0.260	0.60	0.260	0.130	0.57	4.817	0.241	0.54	12.103	0.242

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Average Annualized FCUs - Garth

No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.46	0.20	0.092	0.20	0.092	0.046	0.19	1.702	0.085	0.18	4.277	0.086
	SS	0.10	0.20	0.020	0.20	0.020	0.010	0.19	0.371	0.019	0.18	0.931	0.019
	WQ	0.44	0.20	0.088	0.20	0.088	0.044	0.19	1.625	0.081	0.18	4.083	0.082
	WL	0.23	0.20	0.046	0.20	0.046	0.023	0.19	0.848	0.042	0.18	2.132	0.043
	FS	0.39	0.20	0.078	0.20	0.078	0.039	0.19	1.436	0.072	0.18	3.608	0.072

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 854. Westchester County Center

Average Annualized FCUs - Westchester County Center
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.53	2.00	1.057	2.00	1.057	0.528	1.90	19.575	0.979	1.80	49.188	0.984
	SS	0.14	2.00	0.280	2.00	0.280	0.140	1.90	5.187	0.259	1.80	13.034	0.261
	WQ	0.30	2.00	0.609	2.00	0.609	0.305	1.90	11.285	0.564	1.80	28.357	0.567
	WL	0.15	2.00	0.304	2.00	0.304	0.152	1.90	5.632	0.282	1.80	14.152	0.283
	FS	0.45	2.00	0.900	2.00	0.900	0.450	1.90	16.673	0.834	1.80	41.895	0.838
Alt B	SB	0.53	2.00	1.057	2.00	1.057	0.528	1.90	19.575	0.979	1.80	49.188	0.984
	SS	0.14	2.00	0.280	2.00	0.280	0.140	1.90	5.187	0.259	1.80	13.034	0.261
	WQ	0.30	2.00	0.609	2.00	0.609	0.305	1.90	11.285	0.564	1.80	28.357	0.567
	WL	0.15	2.00	0.304	2.00	0.304	0.152	1.90	5.632	0.282	1.80	14.152	0.283
	FS	0.45	2.00	0.900	2.00	0.900	0.450	1.90	16.673	0.834	1.80	41.895	0.838
Alt C	SB	0.53	2.00	1.057	2.00	1.057	0.528	1.90	19.575	0.979	1.80	49.188	0.984
	SS	0.14	2.00	0.280	2.00	0.280	0.140	1.90	5.187	0.259	1.80	13.034	0.261
	WQ	0.30	2.00	0.609	2.00	0.609	0.305	1.90	11.285	0.564	1.80	28.357	0.567
	WL	0.15	2.00	0.304	2.00	0.304	0.152	1.90	5.632	0.282	1.80	14.152	0.283
	FS	0.45	2.00	0.900	2.00	0.900	0.450	1.90	16.673	0.834	1.80	41.895	0.838

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

No Action Alternative AAFCU Score

Site 860. River Park/West Farm Rapids Park

Average Annualized FCUs - River Park/West Farm Rapids Park
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.66	0.00	0.002	0.00	0.001	0.000	0.00	0.019	0.001	0.00	0.049	0.001
	SS	0.51	0.00	0.002	0.00	0.001	0.000	0.00	0.015	0.001	0.00	0.038	0.001
	WQ	0.35	0.00	0.001	0.00	0.001	0.000	0.00	0.010	0.001	0.00	0.026	0.001
	WL	0.11	0.00	0.000	0.00	0.000	0.000	0.00	0.003	0.000	0.00	0.008	0.000
	FS	0.26	0.00	0.001	0.00	0.000	0.000	0.00	0.007	0.000	0.00	0.019	0.000
Alt B	SB	0.66	0.00	0.002	0.00	0.001	0.000	0.00	0.019	0.001	0.00	0.049	0.001
	SS	0.51	0.00	0.002	0.00	0.001	0.000	0.00	0.015	0.001	0.00	0.038	0.001
	WQ	0.35	0.00	0.001	0.00	0.001	0.000	0.00	0.010	0.001	0.00	0.026	0.001
	WL	0.11	0.00	0.000	0.00	0.000	0.000	0.00	0.003	0.000	0.00	0.008	0.000
	FS	0.26	0.00	0.001	0.00	0.000	0.000	0.00	0.007	0.000	0.00	0.019	0.000
Alt C	SB	0.66	0.00	0.002	0.00	0.001	0.000	0.00	0.019	0.001	0.00	0.049	0.001
	SS	0.51	0.00	0.002	0.00	0.001	0.000	0.00	0.015	0.001	0.00	0.038	0.001
	WQ	0.35	0.00	0.001	0.00	0.001	0.000	0.00	0.010	0.001	0.00	0.026	0.001
	WL	0.11	0.00	0.000	0.00	0.000	0.000	0.00	0.003	0.000	0.00	0.008	0.000
	FS	0.26	0.00	0.001	0.00	0.000	0.000	0.00	0.007	0.000	0.00	0.019	0.000

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 861. Bronx Zoo and Dam

Average Annualized FCUs - Bronx Zoo
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.35	0.43	0.152	0.43	0.152	0.076	0.41	2.813	0.141	0.39	7.068	0.141
	SS	0.63	0.43	0.271	0.43	0.271	0.135	0.41	5.018	0.251	0.39	12.610	0.252
	WQ	0.36	0.43	0.153	0.43	0.153	0.077	0.41	2.838	0.142	0.39	7.131	0.143
	WL	0.22	0.43	0.095	0.43	0.095	0.047	0.41	1.754	0.088	0.39	4.409	0.088
	FS	0.37	0.43	0.159	0.43	0.159	0.080	0.41	2.954	0.148	0.39	7.423	0.148
Alt B	SB	0.35	0.43	0.152	0.43	0.152	0.076	0.41	2.813	0.141	0.39	7.068	0.141
	SS	0.63	0.43	0.271	0.43	0.271	0.135	0.41	5.018	0.251	0.39	12.610	0.252
	WQ	0.36	0.43	0.153	0.43	0.153	0.077	0.41	2.838	0.142	0.39	7.131	0.143
	WL	0.22	0.43	0.095	0.43	0.095	0.047	0.41	1.754	0.088	0.39	4.409	0.088
	FS	0.37	0.43	0.159	0.43	0.159	0.080	0.41	2.954	0.148	0.39	7.423	0.148
Alt C	SB	0.35	0.43	0.15	0.43	0.152	0.076	0.41	2.813	0.141	0.39	7.068	0.141
	SS	0.63	0.43	0.27	0.43	0.271	0.135	0.41	5.018	0.251	0.39	12.610	0.252
	WQ	0.36	0.43	0.15	0.43	0.153	0.077	0.41	2.838	0.142	0.39	7.131	0.143
	WL	0.22	0.43	0.09	0.43	0.095	0.047	0.41	1.754	0.088	0.39	4.409	0.088
	FS	0.37	0.43	0.16	0.43	0.159	0.080	0.41	2.954	0.148	0.39	7.423	0.148

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 863. Stone Mill Dam

Average Annualized FCUs - Stone Mill Dam
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
Alt B	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
Alt C	SB	0.80	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	SS	0.56	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WQ	0.36	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	WL	0.12	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000
	FS	0.40	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000	0.00	0.000	0.000

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 113. Shoelace Park

Average Annualized FCUs - Shoelace Park
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.30	0.02	0.006	0.02	0.006	0.003	0.02	0.110	0.006	0.02	0.277	0.006
	SS	0.16	0.02	0.003	0.02	0.003	0.002	0.02	0.059	0.003	0.02	0.148	0.003
	WQ	0.28	0.02	0.006	0.02	0.006	0.003	0.02	0.105	0.005	0.02	0.263	0.005
	WL	0.15	0.02	0.003	0.02	0.003	0.001	0.02	0.055	0.003	0.02	0.139	0.003
	FS	0.35	0.02	0.007	0.02	0.007	0.004	0.02	0.130	0.006	0.02	0.326	0.007
Alt B	SB	0.30	0.02	0.006	0.02	0.006	0.003	0.02	0.110	0.006	0.02	0.277	0.006
	SS	0.16	0.02	0.003	0.02	0.003	0.002	0.02	0.059	0.003	0.02	0.148	0.003
	WQ	0.28	0.02	0.006	0.02	0.006	0.003	0.02	0.105	0.005	0.02	0.263	0.005
	WL	0.15	0.02	0.003	0.02	0.003	0.001	0.02	0.055	0.003	0.02	0.139	0.003
	FS	0.35	0.02	0.007	0.02	0.007	0.004	0.02	0.130	0.006	0.02	0.326	0.007
Alt C	SB	0.30	0.02	0.006	0.02	0.006	0.003	0.02	0.110	0.006	0.02	0.277	0.006
	SS	0.16	0.02	0.003	0.02	0.003	0.002	0.02	0.059	0.003	0.02	0.148	0.003
	WQ	0.28	0.02	0.006	0.02	0.006	0.003	0.02	0.105	0.005	0.02	0.263	0.005
	WL	0.15	0.02	0.003	0.02	0.003	0.001	0.02	0.055	0.003	0.02	0.139	0.003
	FS	0.35	0.02	0.007	0.02	0.007	0.004	0.02	0.130	0.006	0.02	0.326	0.007

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 862. Muskrat Cove

Average Annualized FCUs - Muskrat Cove
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.55	0.02	0.011	0.02	0.011	0.005	0.02	0.203	0.010	0.02	0.510	0.010
	SS	0.53	0.02	0.011	0.02	0.011	0.005	0.02	0.195	0.010	0.02	0.491	0.010
	WQ	0.34	0.02	0.007	0.02	0.007	0.003	0.02	0.124	0.006	0.02	0.312	0.006
	WL	0.11	0.02	0.002	0.02	0.002	0.001	0.02	0.041	0.002	0.02	0.102	0.002
	FS	0.44	0.02	0.009	0.02	0.009	0.004	0.02	0.164	0.008	0.02	0.411	0.008
Alt B	SB	0.55	0.02	0.011	0.02	0.011	0.005	0.02	0.203	0.010	0.02	0.510	0.010
	SS	0.53	0.02	0.011	0.02	0.011	0.005	0.02	0.195	0.010	0.02	0.491	0.010
	WQ	0.34	0.02	0.007	0.02	0.007	0.003	0.02	0.124	0.006	0.02	0.312	0.006
	WL	0.11	0.02	0.002	0.02	0.002	0.001	0.02	0.041	0.002	0.02	0.102	0.002
	FS	0.44	0.02	0.009	0.02	0.009	0.004	0.02	0.164	0.008	0.02	0.411	0.008
Alt C	SB	0.55	0.02	0.011	0.02	0.011	0.005	0.02	0.203	0.010	0.02	0.510	0.010
	SS	0.53	0.02	0.011	0.02	0.011	0.005	0.02	0.195	0.010	0.02	0.491	0.010
	WQ	0.34	0.02	0.007	0.02	0.007	0.003	0.02	0.124	0.006	0.02	0.312	0.006
	WL	0.11	0.02	0.002	0.02	0.002	0.001	0.02	0.041	0.002	0.02	0.102	0.002
	FS	0.44	0.02	0.009	0.02	0.009	0.004	0.02	0.164	0.008	0.02	0.411	0.008

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 851. Bronxville Lake

Average Annualized FCUs - Bronxville
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.54	0.30	0.162	0.30	0.162	0.081	0.29	2.993	0.150	0.27	7.521	0.150
	SS	0.53	0.30	0.159	0.30	0.159	0.080	0.29	2.945	0.147	0.27	7.401	0.148
	WQ	0.51	0.30	0.154	0.30	0.154	0.077	0.29	2.848	0.142	0.27	7.157	0.143
	WL	0.23	0.30	0.070	0.30	0.070	0.035	0.29	1.293	0.065	0.27	3.250	0.065
	FS	0.43	0.30	0.128	0.30	0.128	0.064	0.29	2.362	0.118	0.27	5.935	0.119
Alt B	SB	0.54	0.30	0.162	0.30	0.162	0.081	0.29	2.993	0.150	0.27	7.521	0.150
	SS	0.53	0.30	0.159	0.30	0.159	0.080	0.29	2.945	0.147	0.27	7.401	0.148
	WQ	0.51	0.30	0.154	0.30	0.154	0.077	0.29	2.848	0.142	0.27	7.157	0.143
	WL	0.23	0.30	0.070	0.30	0.070	0.035	0.29	1.293	0.065	0.27	3.250	0.065
	FS	0.43	0.30	0.128	0.30	0.128	0.064	0.29	2.362	0.118	0.27	5.935	0.119
Alt C	SB	0.54	0.30	0.162	0.30	0.162	0.081	0.29	2.993	0.150	0.27	7.521	0.150
	SS	0.53	0.30	0.159	0.30	0.159	0.080	0.29	2.945	0.147	0.27	7.401	0.148
	WQ	0.51	0.30	0.154	0.30	0.154	0.077	0.29	2.848	0.142	0.27	7.157	0.143
	WL	0.23	0.30	0.070	0.30	0.070	0.035	0.29	1.293	0.065	0.27	3.250	0.065
	FS	0.43	0.30	0.128	0.30	0.128	0.064	0.29	2.362	0.118	0.27	5.935	0.119

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 852. Crestwood Lake

Average Annualized FCUs - Crestwood Lake

No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.85	2.00	1.700	2.00	1.700	0.850	1.90	31.493	1.575	1.80	79.135	1.583
	SS	0.57	2.00	1.130	2.00	1.130	0.565	1.90	20.933	1.047	1.80	52.602	1.052
	WQ	0.57	2.00	1.142	2.00	1.142	0.571	1.90	21.149	1.057	1.80	53.145	1.063
	WL	0.35	2.00	0.696	2.00	0.696	0.348	1.90	12.887	0.644	1.80	32.384	0.648
	FS	0.36	2.00	0.717	2.00	0.717	0.358	1.90	13.276	0.664	1.80	33.361	0.667
Alt B	SB	0.85	2.00	1.700	2.00	1.700	0.850	1.90	31.493	1.575	1.80	79.135	1.583
	SS	0.57	2.00	1.130	2.00	1.130	0.565	1.90	20.933	1.047	1.80	52.602	1.052
	WQ	0.57	2.00	1.142	2.00	1.142	0.571	1.90	21.149	1.057	1.80	53.145	1.063
	WL	0.35	2.00	0.696	2.00	0.696	0.348	1.90	12.887	0.644	1.80	32.384	0.648
	FS	0.36	2.00	0.717	2.00	0.717	0.358	1.90	13.276	0.664	1.80	33.361	0.667
Alt C	SB	0.85	2.00	1.70	2.00	1.700	0.850	1.90	31.493	1.575	1.80	79.135	1.583
	SS	0.57	2.00	1.13	2.00	1.130	0.565	1.90	20.933	1.047	1.80	52.602	1.052
	WQ	0.57	2.00	1.14	2.00	1.142	0.571	1.90	21.149	1.057	1.80	53.145	1.063
	WL	0.35	2.00	0.70	2.00	0.696	0.348	1.90	12.887	0.644	1.80	32.384	0.648
	FS	0.36	2.00	0.72	2.00	0.717	0.358	1.90	13.276	0.664	1.80	33.361	0.667

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval;   T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 853. Garth Woods and Harney Road

Average Annualized FCUs - Harney Road
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.55	0.60	0.332	0.60	0.332	0.166	0.57	6.148	0.307	0.54	15.449	0.309
	SS	0.11	0.60	0.066	0.60	0.066	0.033	0.57	1.223	0.061	0.54	3.072	0.061
	WQ	0.28	0.60	0.165	0.60	0.165	0.083	0.57	3.057	0.153	0.54	7.681	0.154
	WL	0.17	0.60	0.104	0.60	0.104	0.052	0.57	1.921	0.096	0.54	4.827	0.097
	FS	0.43	0.60	0.260	0.60	0.260	0.130	0.57	4.817	0.241	0.54	12.103	0.242
Alt B	SB	0.55	0.60	0.332	0.60	0.332	0.166	0.57	6.148	0.307	0.54	15.449	0.309
	SS	0.11	0.60	0.066	0.60	0.066	0.033	0.57	1.223	0.061	0.54	3.072	0.061
	WQ	0.28	0.60	0.165	0.60	0.165	0.083	0.57	3.057	0.153	0.54	7.681	0.154
	WL	0.17	0.60	0.104	0.60	0.104	0.052	0.57	1.921	0.096	0.54	4.827	0.097
	FS	0.43	0.60	0.260	0.60	0.260	0.130	0.57	4.817	0.241	0.54	12.103	0.242
Alt C	SB	0.55	0.60	0.332	0.60	0.332	0.166	0.57	6.148	0.307	0.54	15.449	0.309
	SS	0.11	0.60	0.066	0.60	0.066	0.033	0.57	1.223	0.061	0.54	3.072	0.061
	WQ	0.28	0.60	0.165	0.60	0.165	0.083	0.57	3.057	0.153	0.54	7.681	0.154
	WL	0.17	0.60	0.104	0.60	0.104	0.052	0.57	1.921	0.096	0.54	4.827	0.097
	FS	0.43	0.60	0.260	0.60	0.260	0.130	0.57	4.817	0.241	0.54	12.103	0.242

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Average Annualized FCUs - Garth
No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.46	0.20	0.092	0.20	0.092	0.046	0.19	1.702	0.085	0.18	4.277	0.086
	SS	0.10	0.20	0.020	0.20	0.020	0.010	0.19	0.371	0.019	0.18	0.931	0.019
	WQ	0.44	0.20	0.088	0.20	0.088	0.044	0.19	1.625	0.081	0.18	4.083	0.082
	WL	0.23	0.20	0.046	0.20	0.046	0.023	0.19	0.848	0.042	0.18	2.132	0.043
	FS	0.39	0.20	0.078	0.20	0.078	0.039	0.19	1.436	0.072	0.18	3.608	0.072

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Site 854. Westchester County Center

Average Annualized FCUs - Westchester County Center

No Action Alternative AAFCU

Alternatives	EPW Wetland Functions	WAA (Existing)			Year 2			Year 20			Year 50		
		FCI	AREA	FCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU	AREA	Cumulative FCU	AAFCU
Alt A	SB	0.53	2.00	1.057	2.00	1.057	0.528	1.90	19.575	0.979	1.80	49.188	0.984
	SS	0.14	2.00	0.280	2.00	0.280	0.140	1.90	5.187	0.259	1.80	13.034	0.261
	WQ	0.30	2.00	0.609	2.00	0.609	0.305	1.90	11.285	0.564	1.80	28.357	0.567
	WL	0.15	2.00	0.304	2.00	0.304	0.152	1.90	5.632	0.282	1.80	14.152	0.283
	FS	0.45	2.00	0.900	2.00	0.900	0.450	1.90	16.673	0.834	1.80	41.895	0.838
Alt B	SB	0.53	2.00	1.057	2.00	1.057	0.528	1.90	19.575	0.979	1.80	49.188	0.984
	SS	0.14	2.00	0.280	2.00	0.280	0.140	1.90	5.187	0.259	1.80	13.034	0.261
	WQ	0.30	2.00	0.609	2.00	0.609	0.305	1.90	11.285	0.564	1.80	28.357	0.567
	WL	0.15	2.00	0.304	2.00	0.304	0.152	1.90	5.632	0.282	1.80	14.152	0.283
	FS	0.45	2.00	0.900	2.00	0.900	0.450	1.90	16.673	0.834	1.80	41.895	0.838
Alt C	SB	0.53	2.00	1.057	2.00	1.057	0.528	1.90	19.575	0.979	1.80	49.188	0.984
	SS	0.14	2.00	0.280	2.00	0.280	0.140	1.90	5.187	0.259	1.80	13.034	0.261
	WQ	0.30	2.00	0.609	2.00	0.609	0.305	1.90	11.285	0.564	1.80	28.357	0.567
	WL	0.15	2.00	0.304	2.00	0.304	0.152	1.90	5.632	0.282	1.80	14.152	0.283
	FS	0.45	2.00	0.900	2.00	0.900	0.450	1.90	16.673	0.834	1.80	41.895	0.838

For year 20, it was assumed that there will be a 5% loss in wetland acreage due to erosion.
For year 50, it was assumed that there will be a 10% loss in wetland acreage due to erosion.

Calculations:
AAFCUs = Cumulative FCUs ÷ Number of years in the life of the project, where:
Cumulative FCUs = Sum (T2 -T1)[((A1 F1 +A2 F2) / 3) + ((A2 F1 +A1 F2) / 6)] and where:
T1 = First Target Year time interval; T2 = Second Target Year time interval; A1 = Area of available wetland assessment area at beginning of T1
A2 = Area of available wetland assessment area at end of T2; F1 = FCI at beginning of T1; F2 = FCI at end of T2

Attachment C
SVAP Data Sheets

Site 860. River Park/West Farm Rapids Park

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: AECOM/e4sciences Date: 16 July 2014
Stream name: Bronx River Waterbody ID Number: ________________________
Reach Location: Bronx River Park

Ecoregion: _________________ Drainage Area: __________________ Gradient:______________________
Applicable Reference Site:____
Land use within drainage (%): row crop _____ hayland_____grazing/pasture______forest_______ residential__________
confined animal feeding operations ________ Cons. Reserve _______ industrial _______ other: ________________________
Weather conditions-today Warm Past 2-5 days Warm +85˚
Active channel width ~10 m Dominant substrate: boulder ✓ gravel____ sand ____ silt____ mud _______

Assessment Scores

	Existing	A	B	C	A+20	B+20	C+20
Channel Condition	3	7	7	6	7	7	6
Hydrologic Alteration	1	1	1	1	1	1	1
Riparian Zone	1	5	4	3	5	4	3
Bank Stability	10	10	10	10	10	10	10
Water Appearance	7	8	8	8	8	8	8
Nutrient Enrichment	5	6	6	6	6	6	6
Barriers to Fish Movement	1	7	7	7	7	7	7
Instream Fish Cover	3	5	4	3	5	4	3
Pools	7	8	8	8	8	8	8
Invertebrate Habitat	3	4.5	4	4	4.5	4	4

Score only if applicable

Canopy Cover	5	6	5	5	6	5	5
Manure Presence							
Salinity							
Riffle Embeddedness	5	6.5	6	6	6.5	6	6
Macroinvertebrates Observed (optional)							
Overall Score	**4.3**	**6.2**	**5.8**	**5.6**	**6.2**	**5.8**	**5.6**

(Total divided by number scored)

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 861. Bronx Zoo and Dam

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: AECOM/e4sciences Date: 16 July 2014
Stream name: Bronx River Waterbody ID Number: ______________
Reach Location: Bronx Zoo

Ecoregion: ________________ Drainage Area: __________________ Gradient: ______________
Applicable Reference Site: ______________
Land use within drainage (%): row crop _____ hayland_____ grazing/pasture______ forest_______ residential______
confined animal feeding operations ________ Cons. Reserve _______ industrial _______ other: 50% lawn 50% zoo
Weather conditions-today 80˚F Past 2-5 days +80˚F
Active channel width ~ 5 m Dominant substrate: boulder____ gravel____ sand ✓ silt______ mud ______

Assessment Scores

Metrics	Existing	A	B	C	A+20yr	B+20yr	C+20yr
Channel Condition	7	7	7	7	7	7	7
Hydrologic Alteration	1	1	1	1	1	1	1
Riparian Zone	5	8	8	8	8	8	8
Bank Stability	7	8	8	7	8	8	7
Water Appearance	7	8	8	8	8	8	8
Nutrient Enrichment	7	8	8	8	8	8	8
Barriers to Fish Movement	1	9	9	9	9	9	9
Instream Fish Cover	3	5	5	4	5	5	4
Pools	3	4	4	4	4	4	4
Invertebrate Habitat	3	6	6	5	6	6	5

Score only if applicable

Canopy Cover	1	2	2	2	2	2	2
Manure Presence	1	2	2	2	2	2	2
Salinity							
Riffle Embeddedness	5	7	7	5	7	7	5
Macroinvertebrates Observed (optional)							
Final Scores	**3.9**	**5.8**	**5.8**	**5.4**	**5.8**	**5.8**	**5.4**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 863. Stone Mill Dam

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: _AECOM/e4sciences__ Date: _21 July 2014______________
Stream name: __Bronx River___________ Waterbody ID Number: ____
Reach Location: Stone Mill Dam

Ecoregion: _________________ Drainage Area: __________________ Gradient:____________________________
Applicable Reference Site:____
Land use within drainage (%): row crop _____ hayland_____grazing/pasture______forest_______ residential________________
confined animal feeding operations ________ Cons. Reserve ________ industrial _______ other: ______________________________
Weather conditions-today _~80˚ F________________ Past 2-5 days _>80˚F_______________________________
Active channel width________ Dominant substrate: boulder____ gravel____ sand _✓___ silt______ mud _______________

Assessment Scores

Metrics	**Existing**	**A**	**B**	**C**	**A+20yr**	**B+20yr**	**C+20yr**
Channel Condition	8	8	8	8	8	8	8
Hydrologic Alteration	1	1	1	1	1	1	1
Riparian Zone	8	8.5	8.5	8	8.5	8.5	8
Bank Stability	7	7	7	7	7	7	7
Water Appearance	8	8	8	8	8	8	8
Nutrient Enrichment	8	8	8	8	8	8	8
Barriers to Fish Movement	1	9	9	1	9	9	1
Instream Fish Cover	5	5	5	5	5	5	5
Pools	7	7	7	8	7	7	8

Invertebrate Habitat

Score only if applicable

Canopy Cover	10	10	10	10	10	10	10
Manure Presence							
Salinity							
Riffle Embeddedness	5	5	5	6	5	5	6
Macroinvertebrates Observed (optional)							
Final Scores	**6.2**	**7.0**	**7.0**	**6.4**	**7.0**	**7.0**	**6.4**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 113. Shoelace Park

Stream Visual Assessment Protocol

Owners Name: ______ Evaluator's name: AECOM/e4sciences Date: 1 July 2014

Stream name: Bronx River Waterbody ID Number: ______

Reach Location: Shoelace Park

Ecoregion: ______ Drainage Area: ______ Gradient: ______

Applicable Reference Site: ______

Land use within drainage (%): row crop ____ hayland ____ grazing/pasture ____ forest ____ residential SO

confined animal feeding operations ____ Cons. Reserve ____ industrial ____ other: SO Roads

Weather conditions-today Hot Past 2-5 days Warm

Active channel width 20-30ft Dominant substrate: boulder ____ gravel ____ sand ✓ silt ✓ mud ____

Assessment Scores

Metrics	**Existing**	**A**	**B**	**C**	**A+20yr**	**B+20yr**	**C+20yr**
Channel Condition	3	7	6	5.5	7.5	6	5
Hydrologic Alteration	3	4	4	4	4	4	4
Riparian Zone	5	7	5.5	5	7	5.5	5
Bank Stability	3	8	7	6	8.5	7.5	6.5
Water Appearance	7	7	7	7	7	7	7
Nutrient Enrichment	8	8	8	8	8	8	8
Barriers to Fish Movement	8	8	8	8	9	9	9
Instream Fish Cover	5	7	5.5	5	7	5.5	5
Pools	3	8	7	3	8	7	3
Invertebrate Habitat	5	6	5.5	5	6	5.5	5

Score only if applicable

Canopy Cover	5	6	5	5	7.5	5	5
Manure Presence							
Salinity							
Riffle Embeddedness	3	6	5	3	6	5	3
Macroinvertebrates Observed (optional)							
Final Scores	**4.8**	**6.8**	**6.1**	**5.4**	**7.1**	**6.3**	**5.5**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 862. Muskrat Cove

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: AECOM/e4sciences Date: 2 July 2014

Stream name: Bronx River Waterbody ID Number: ______________

Reach Location: Muskrat Cove

Ecoregion: ______________ Drainage Area: ______________ Gradient: ______________

Applicable Reference Site: ______________

Land use within drainage (%): row crop _____ hayland _____ grazing/pasture _____ forest _____ residential SO

confined animal feeding operations _____ Cons. Reserve 100* _____ industrial _____ other: SO Roads

Weather conditions-today Warm Past 2-5 days Warm 80˚F

Active channel width ~30ft Dominant substrate: boulder ____ gravel ✓ sand ____ silt ____ mud ____

* within a park with woodlands, bounded by a rail ROW and dense residential

Assessment Scores

Metrics	**Existing**	**A**	**B**	**C**	**A+20yr**	**B+20yr**	**C+20yr**
Channel Condition	1	5	5	5	5	5	5
Hydrologic Alteration	4	5	7	5	5	7	5
Riparian Zone	8	9	9	9	9	9	9
Bank Stability	1	6	6	5	6	6	5
Water Appearance	9	9	9	9	9	9	9
Nutrient Enrichment	9	9	9	9	9	9	9
Barriers to Fish Movement	10	10	10	10	10	10	10
Instream Fish Cover	5	5	5	5	5	5	5
Pools	4	7	7	5	7	7	5
Invertebrate Habitat	6	6	6	6	6	6	6

Score only if applicable

Canopy Cover	7	7	7	7	7	7	7
Manure Presence							
Salinity							
Riffle Embeddedness	7	7	8	8	7	8	8
Macroinvertebrates Observed (optional)							
Final Scores	**5.9**	**7.1**	**7.3**	**6.9**	**7.1**	**7.3**	**6.9**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 851. Bronxville Lake

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: AECOM/e4sciences Date: 10 July 2014
Stream name: Bronx River Waterbody ID Number: ____________
Reach Location: Bronxville Lake

Ecoregion: ____________ Drainage Area: ____________ Gradient: ____________
Applicable Reference Site: ____________
Land use within drainage (%): row crop _____ hayland_____ grazing/pasture______ forest_______ residential 85
confined animal feeding operations ________ Cons. Reserve _______ industrial _______ other: 15 Highway
Weather conditions-today Sunny Warm Past 2-5 days ~ 80˚F
Active channel width Dammed Lake Dominant substrate: boulder___ gravel____ sand ____ silt_____ mud ✓

Assessment Scores

Metrics	Existing	A	B	C	A+20yr	B+20yr	C+20yr
Channel Condition	1	7	6	6	7	6	6
Hydrologic Alteration	3	3	3	3	3	3	3
Riparian Zone	1	10	5	2	10	5	2
Bank Stability	5	7	5	5	7	5	5
Water Appearance	7	7	7	7	7	7	7
Nutrient Enrichment	5	6	6	6	6	6	6
Barriers to Fish Movement	5	10	10	10	10	10	10
Instream Fish Cover	1	3	3	1	3	3	1
Pools	2	2	8	8	2	8	8
Invertebrate Habitat	3	5	5	4	5	5	4

Score only if applicable

Canopy Cover	1	1	1	1	1	1	1
Manure Presence	1	3	3	2	3	3	2
Salinity							
Riffle Embeddedness							
Macroinvertebrates Observed (optional)							
Final Scores	**2.9**	**5.3**	**5.2**	**4.6**	**5.3**	**5.2**	**4.6**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 852. Crestwood Lake

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: AECOM/e4sciences Date: 9 July 2014
Stream name: Bronx River Waterbody ID Number: ______________
Reach Location: Crestwood Lake

Ecoregion: ______________ Drainage Area: ______________ Gradient: ______________
Applicable Reference Site: ______________
Land use within drainage (%): row crop _____ hayland_____grazing/pasture______forest_______ residential______________
confined animal feeding operations ________ Cons. Reserve _______ industrial _______ other: 70 Park 30˚ Road
Weather conditions-today Warm Past 2-5 days Hot > 90˚
Active channel width Dammed Lake Dominant substrate: boulder____ gravel____ sand ____ silt____ mud ✓

Assessment Scores

Metrics	**Existing**	**A**	**B**	**C**	**A+20yr**	**B+20yr**	**C+20yr**
Channel Condition	7	9	7	7	9	7	7
Hydrologic Alteration	3	5	5	5	5	5	5
Riparian Zone	5	8	6	5	8	6	5
Bank Stability	5	6	6	6	6	6	6
Water Appearance	7	7	7	7	7	7	7
Nutrient Enrichment	7	7	7	7	7	7	7
Barriers to Fish Movement	1	1	1	1	1	1	1
Instream Fish Cover	3	3	3	3	3	3	3
Pools	2	2	2	2	2	2	2
Invertebrate Habitat	3	3	3	3	3	3	3
	Score only if applicable						
Canopy Cover	1	1	1	1	1	1	1
Manure Presence	1	1	1	1	1	1	1
Salinity							
Riffle Embeddedness							
Macroinvertebrates Observed (optional)							
Final Scores	**3.8**	**4.4**	**4.1**	**4.0**	**4.4**	**4.1**	**4.0**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 853. Garth Woods and Harney Road

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: AECOM/e4sciences Date: 18 July 2014

Stream name: Bronx River Waterbody ID Number: ______________

Reach Location: Garth Woods

Ecoregion: ______________ Drainage Area: ______________ Gradient: ______________

Applicable Reference Site: ______________

Land use within drainage (%): row crop _____ hayland_____ grazing/pasture______ forest 50% residential______________

confined animal feeding operations ________ Cons. Reserve _______ industrial _______ other: 50% Road embankments

Weather conditions-today + 80˚F Past 2-5 days ______________

Active channel width ~ 6m Dominant substrate: boulder ✓ gravel_____ sand _____ silt_____ mud ______________

Assessment Scores

	Existing	A	A+20
Channel Condition	5	5	5
Hydrologic Alteration	3	3	3
Riparian Zone	5	6	6
Bank Stability	7	7	7
Water Appearance	8	8	8
Nutrient Enrichment	10	10	10
Barriers to Fish Movement	3	3	3
Instream Fish Cover	5	5	5
Pools	7	7	7
Invertebrate Habitat	7	7	7

Score only if applicable

Canopy Cover	10	10	10
Manure Presence			
Salinity			
Riffle Embeddedness	8	8	8
Macroinvertebrates Observed (optional)			
Overall Score	**6.5**	**6.6**	**6.6**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Stream Visual Assessment Protocol

Owners Name: ______________ Evaluator's name: AECOM/e4sciences Date: 18 July 2014
Stream name: Bronx River Waterbody ID Number: ______________
Reach Location: Harney Pond

Ecoregion: ______________ Drainage Area: ______________ Gradient: ______________
Applicable Reference Site: ______________
Land use within drainage (%): row crop _____ hayland _____ grazing/pasture _____ forest _____ residential _____
confined animal feeding operations _____ Cons. Reserve _____ industrial _____ other: 50% Road 50% Park
Weather conditions-today + 80˚F Past 2-5 days Warm + 80˚F
Active channel width ~ 10m Dominant substrate: boulder____ gravel_____ sand _____ silt_____ mud _____

Assessment Scores

Metrics	**Existing**	**A**	**B**	**C**	**A+20yr**	**B+20yr**	**C+20yr**
Channel Condition	3	7	7	4	7	7	4
Hydrologic Alteration	1	4	1	1	4	1	1
Riparian Zone	7	9	8	8	9	8	8
Bank Stability	7	9	8	8	9	8	8
Water Appearance	7	7	7	7	7	7	7
Nutrient Enrichment	8	8	8	8	8	8	8
Barriers to Fish Movement	1	5	3	3	5	3	3
Instream Fish Cover	3	3	3	3	3	3	3
Pools	3	7	6	4	7	6	4
Invertebrate Habitat	3	3	3	3	3	3	3

Score only if applicable

Canopy Cover	1	1	1	1	1	1	1
Manure Presence							
Salinity							
Riffle Embeddedness							
Macroinvertebrates Observed (optional)							
Final Scores	**4.0**	**5.7**	**5.0**	**4.5**	**5.7**	**5.0**	**4.5**

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Site 854. Westchester County Center

Stream Visual Assessment Protocol

Owners Name: ____________ Evaluator's name: AECOM/e4sciences Date: 17 July 2014
Stream name: Bronx River Waterbody ID Number: ____________
Reach Location: Westchester County Center

Ecoregion: ____________ Drainage Area: ____________ Gradient: ____________
Applicable Reference Site: ____________
Land use within drainage (%): row crop _____ hayland _____ grazing/pasture _____ forest _____ residential _____
confined animal feeding operations _____ Cons. Reserve _____ industrial _____ other: 100% Highway & Park

Weather conditions-today Warm 85˚F Past 2-5 days Warm + 85˚F (heavy rain 5 days ago)
Active channel width 3-6m Dominant substrate: boulder _____ gravel _____ sand ✓ silt _____ mud _____

Assessment Scores

	Existing	A	B	C	A+20	B+20	C+20
Channel Condition	5	7	7	7	7	7	7
Hydrologic Alteration	5	7	7	7	7	7	7
Riparian Zone	8	10	10	9	10	10	9
Bank Stability	5	5	7	7	5	7	7
Water Appearance	7	7	7	7	7	7	7
Nutrient Enrichment	7	7	7	7	7	7	7
Barriers to Fish Movement	10	10	10	10	10	10	10
Instream Fish Cover	5	5	5	5	5	5	5
Pools	3	3	7	3	3	7	3
Invertebrate Habitat	3	3	3	3	3	3	3

Score only if applicable

Canopy Cover	10	10	10	10	10	10	10
Manure Presence							
Salinity							
Riffle Embeddedness	3	3	5	3	3	5	3
Macroinvertebrates Observed (optional)							
Overall Score	**5.91667**	**6.4167**	**7.0833**	**6.5**	**6.4167**	**7.0833**	**6.5**

(Total divided by number scored)

Poor	< 6.0
Fair	6.1-7.4
Good	7.5-8.9
Excellent	>9.0

Appendix D

Upland Buffer Sheets

Site 860. River Park/West Farm Rapids Park

Upland Buffer

Site Name: Bronx River Park

Date: 16 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Ian Nesbitt (e4sciences), Kurt Schollmeyer (e4sciences)

Weather Condition: Mostly Sunny ~82 ˚F

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	✓
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25% wall/rock/trees	✓
b. 25%-50%	
c. 51%-75%	
d. >75% Forested	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25% wall/rock/trees	✓
b. 25%-50% Forested	✓
c. 51%-75%	
d. >75%	
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	✓
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Site 861. Bronx Zoo and Dam

Upland Buffer

Site Name: Bronx Zoo

Date: 16 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75% Riparian wooded	✓
d. >75% Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Riparian wooded Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Site 863. Stone Mill Dam

Upland Buffer

Site Name: Stone Mill Dam

Date: 21 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75% Riparian wooded	✓
d. >75% Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Riparian wooded Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Site 113. Shoelace Park

Upland Buffer

Site Name: Shoelace Park

Date: 1 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75% Riparian wooded	✓
d. >75% Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Riparian wooded Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	
c. Surface runoff is substantial	✓
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Site 862. Muskrat Cove

Upland Buffer

Site Name: Muskrat Cove

Date: 2 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive. (intended)	
What is the percent cover of each vegetation type within each distinct zone?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	
e. Commercial buildings/apartment	
f. Single family houses	
g. Railroad	✓

Site 851. Bronxville Lake

Upland Buffer

Site Name: Bronxville

Date: 10 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive. (intended)	
What is the percent cover of each vegetation type within each distinct zone?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. Surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	
e. Commercial buildings/apartment	
f. Single family houses	
g. Railroad	✓

Site 852. Crestwood Lake

Upland Buffer

Site Name: Crestwood Lake

Date: 9 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~85ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct zone?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested Riparian buffer Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested Riparian buffer	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	✓
b. surface runoff is moderate	
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	
e. Commercial buildings/apartment	
f. Single family houses	✓
g. Railroad	

Site 853. Garth Woods and Harney Road

Upland Buffer

Site Name: Garth Woods

Date: 18 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	
b. no distinct zones are present, area is well vegetated	✓
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested	✓
c. 51%-75%	
d. >75%	
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b.Surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Upland Buffer

Site Name: Harney Road

Date: 18 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer(e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Lawn Forested Invasives	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25% Forested	✓
b. 25%-50% Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Site 854. Westchester County Center

Upland Buffer

Site Name: Westchester County Center

Date: 17 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Bruce Ward (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Lawn Forested Invasives	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25% Forested	✓
b. 25%-50% Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	✓
c. Parking lot	✓
d. Paved path or service road	✓
e. Commercial buildings/apartment	
f. Single family houses	
g. Railroad	

Attachment D
Upland Buffer Data Sheets

River Park/West Farm Rapids Park

Upland Buffer

Site Name: Bronx River Park

Date: 16 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Ian Nesbitt (e4sciences), Kurt Schollmeyer (e4sciences)

Weather Condition: Mostly Sunny ~82 ˚F

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	✓
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25% wall/rock/trees	✓
b. 25%-50%	
c. 51%-75%	
d. >75% Forested	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25% wall/rock/trees	✓
b. 25%-50% Forested	✓
c. 51%-75%	
d. >75%	
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	✓
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Bronx Zoo and Dam

Upland Buffer

Site Name: Bronx Zoo

Date: 16 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75% Riparian wooded	✓
d. >75% Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Riparian wooded Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Stone Mill Dam

Upland Buffer

Site Name: Shoelace Park

Date: 1 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75% Riparian wooded	✓
d. >75% Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Riparian wooded Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	
c. Surface runoff is substantial	✓
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Shoelace Park

Upland Buffer

Site Name: Shoelace Park

Date: 1 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75% Riparian wooded	✓
d. >75% Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Riparian wooded Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	
c. Surface runoff is substantial	✓
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Muskrat Cove

Upland Buffer

Site Name: Muskrat Cove

Date: 2 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive. (intended)	
What is the percent cover of each vegetation type within each distinct zone?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	
e. Commercial buildings/apartment	
f. Single family houses	
g. Railroad	✓

Bronxville Lake

Upland Buffer

Site Name: Bronxville

Date: 10 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive. (intended)	
What is the percent cover of each vegetation type within each distinct zone?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested Invasives Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. Surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	
e. Commercial buildings/apartment	
f. Single family houses	
g. Railroad	✓

Crestwood Lake

Upland Buffer

Site Name: Crestwood Lake

Date: 9 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~85ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct zone?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested Riparian buffer Lawn	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested Riparian buffer	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics: 2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	✓
b. surface runoff is moderate	
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	
e. Commercial buildings/apartment	
f. Single family houses	✓
g. Railroad	

Harney Road & Garth Woods

Upland Buffer

Site Name: Garth Woods

Date: 18 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	
b. no distinct zones are present, area is well vegetated	✓
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Forested	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25%	
b. 25%-50% Forested	✓
c. 51%-75%	
d. >75%	
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b.Surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Upland Buffer

Site Name: Harney Road

Date: 18 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Kurt Schollmeyer(e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Lawn Forested Invasives	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25% Forested	✓
b. 25%-50% Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	✓
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	
b. Light use road (three lanes or less?)	✓
c. Parking lot	
d. Paved path or service road	✓
e. Commercial buildings/apartment	✓
f. Single family houses	
g. Railroad	

Westchester County Center

Upland Buffer

Site Name: Westchester County Center

Date: 17 July 2014

People: Karen Appell (AECOM), John Rollino (AECOM), Bruce Ward (e4sciences), Ian Nesbit (e4sciences)

Weather Condition: ~82ºF

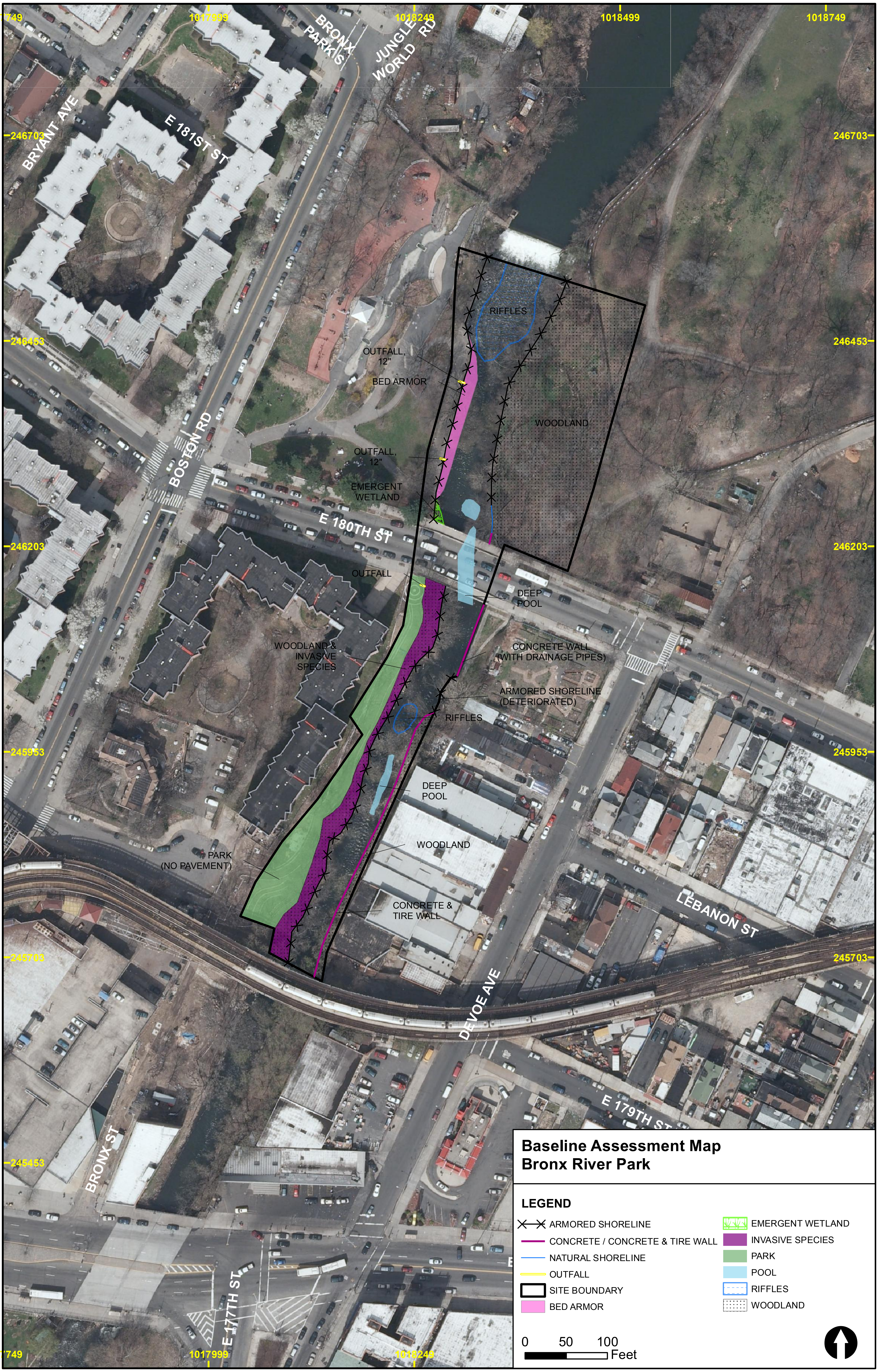
Element	Score
1. Physical Characteristics	
1a. Does the buffer have distinct vegetation zones	
a. two or more distinct zones are present and well vegetated	✓
b. no distinct zones are present, area is well vegetated	
c. no distinct zones, poor vegetation	
1b. Is the vegetation in the buffer strip native or non-native/ invasive.	
What is the percent cover of each vegetation type within each distinct strip?	
a. <25%	
b. 25%-50%	
c. 51%-75%	
d. >75% Lawn Forested Invasives	✓
1c. Is the vegetation dense enough at ground level to provide filtration and help spread the water coming from the upland, or does water running from uplands?	
What is the percent of cover within each strip? (basal cover)	
a. <25% Forested	✓
b. 25%-50% Invasives	✓
c. 51%-75%	
d. >75% Lawn	✓
1d. What is the width of the buffer?	
Buffer vegetation extends	
a. 100% of the active channel width on each side	✓
b. 51%-75% of the active channel width on each side	
c. 25%-50% of the active channel width on each side	
d. <25% of the active channel width on each side	
2. Temporal Characteristics:	
2a. What is the location and makeup of adjacent habitat?	
a. Wetland (emergent)	
b. Open water	
c. Wet meadow (seasonally mowed lawn)	
d. Forest/scrub shrub community	
e. Anthropogenic development	✓

Element	Score
2b. What is the continuity of the buffer?	
Upland buffer provides:	
a. 100% continuous coverage of the project area and/or comprises part of a matrix of habitats.	✓
b. 51-75% coverage of the project area and/or comprises part of a matrix of habitats	
c. 25-50% coverage of the project area and/or comprises part of a matrix of habitats	
d. <25% coverage of the project area and/or comprises part of a matrix of habitats	
3. Water Quality: Sources and Filtering Ability of Non-point Source Pollution	
3a. Proximity of buffer strip to source of NPSP? To be determined through visual evidence at the site (i.e. concrete, culverts, bare ground)	
Surface Runoff:	
a. Surface runoff is minimal because of infiltration and drainage control	
b. surface runoff is moderate	✓
c. Surface runoff is substantial	
Adjacent anthropogenic land use (pick all that apply)	
a. Parkway or heavy use road *(four lanes or greater?)	✓
b. Light use road (three lanes or less?)	✓
c. Parking lot	✓
d. Paved path or service road	✓
e. Commercial buildings/apartment	
f. Single family houses	
g. Railroad	

Appendix E

Baseline Assessment Maps

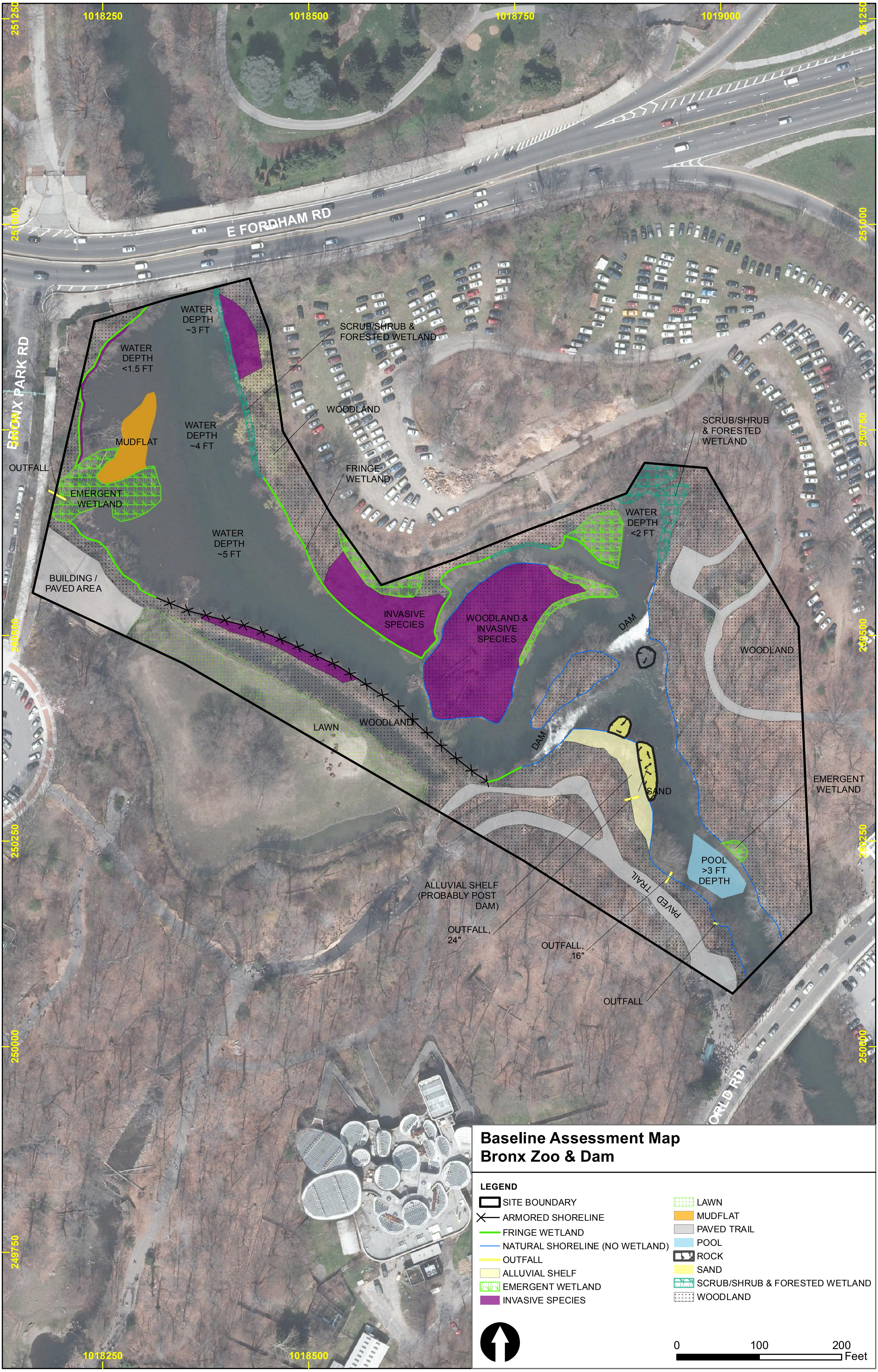
Site 860. River Park/West Farm Rapids Park



Baseline Assessment Map
Bronx River Park

Site 861. Bronx Zoo and Dam

Baseline Assessment Map
Bronx Zoo & Dam

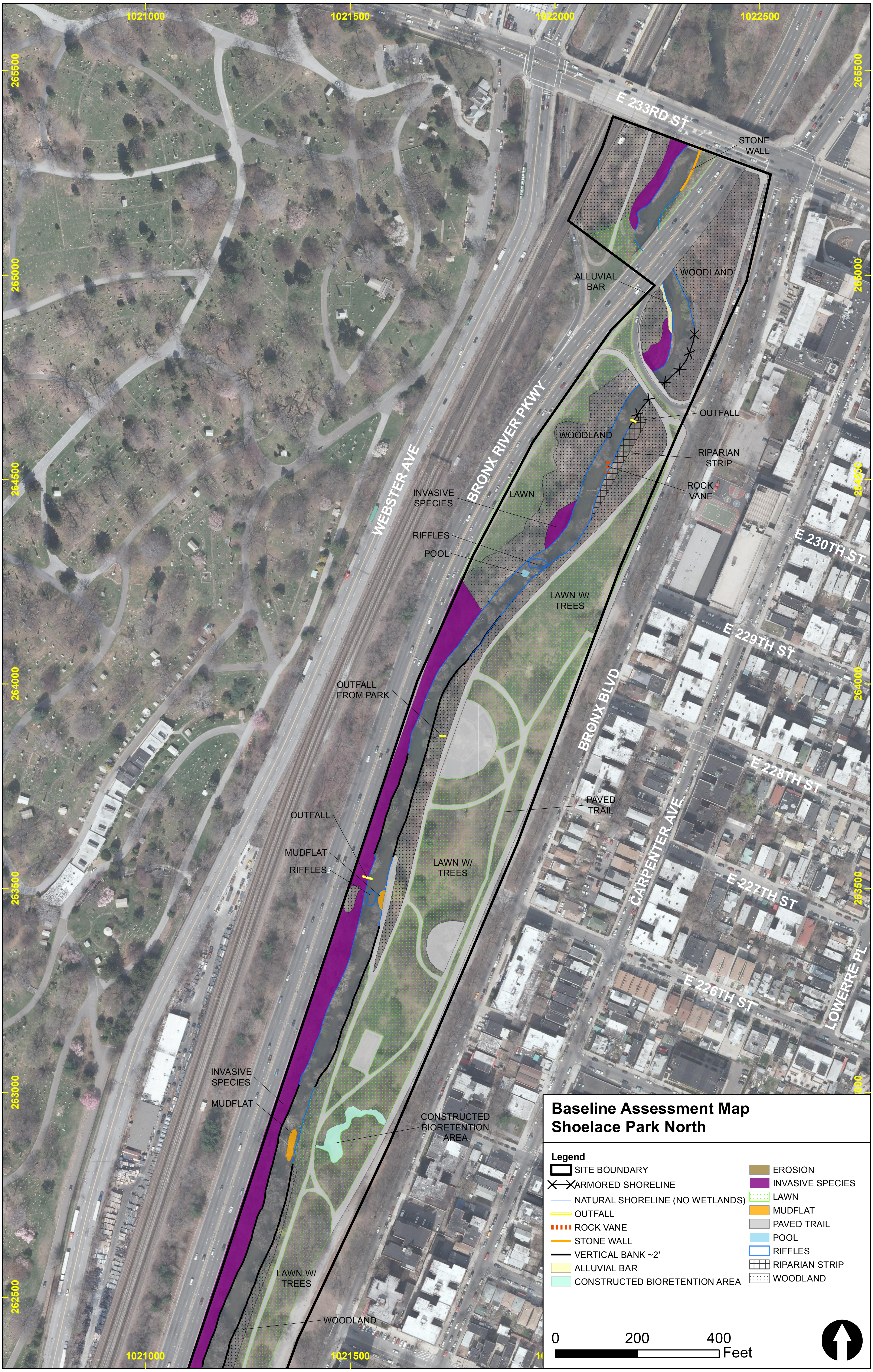


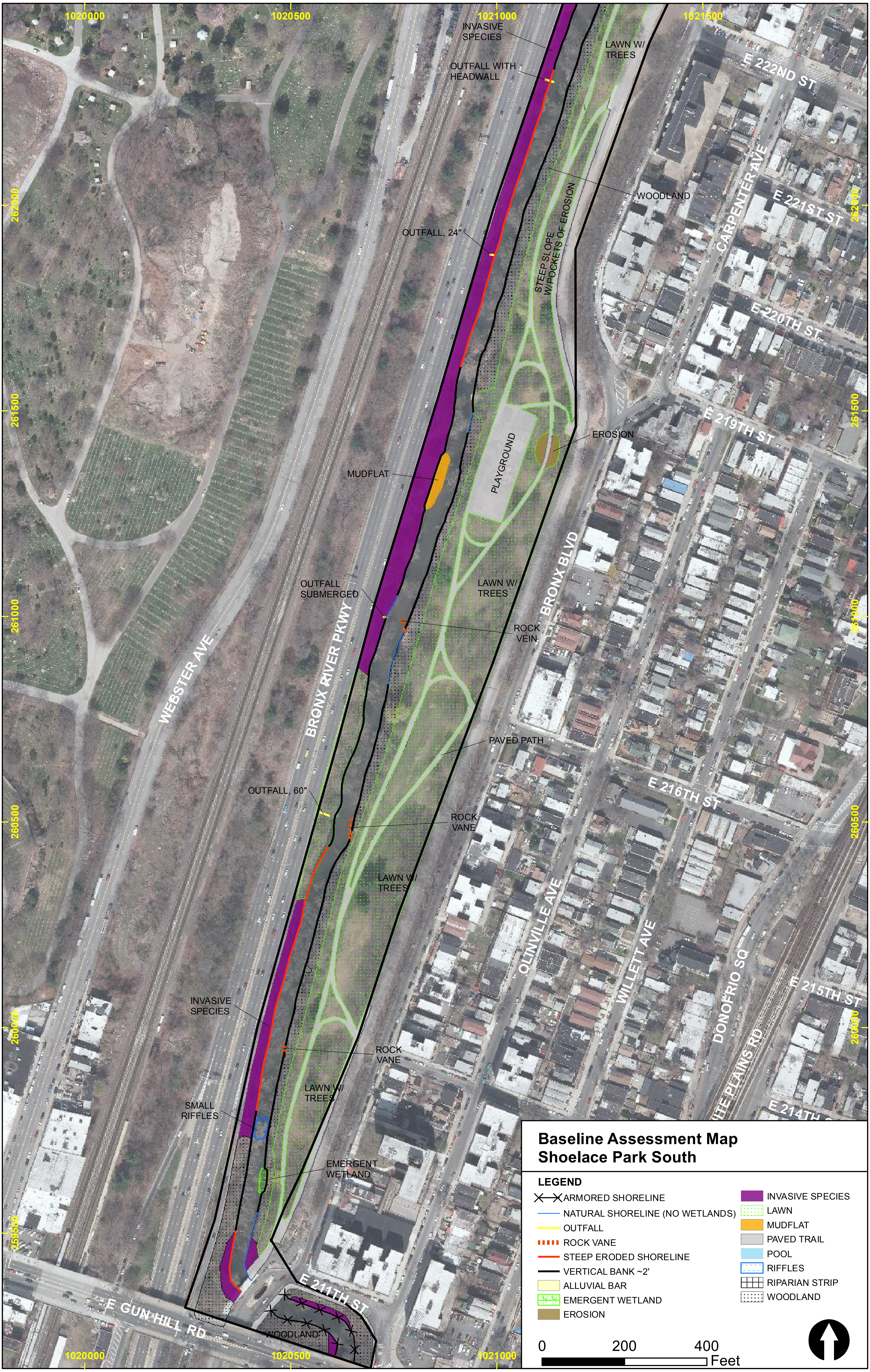
Site 863. Stone Mill Dam

Baseline Assessment Map
Stone Mill Dam

Site 113. Shoelace Park

Baseline Assessment Map
Shoelace Park North





Baseline Assessment Map
Shoelace Park South

Site 862. Muskrat Cove

Baseline Assessment Map
Muskrat Cove

Site 851. Bronxville Lake

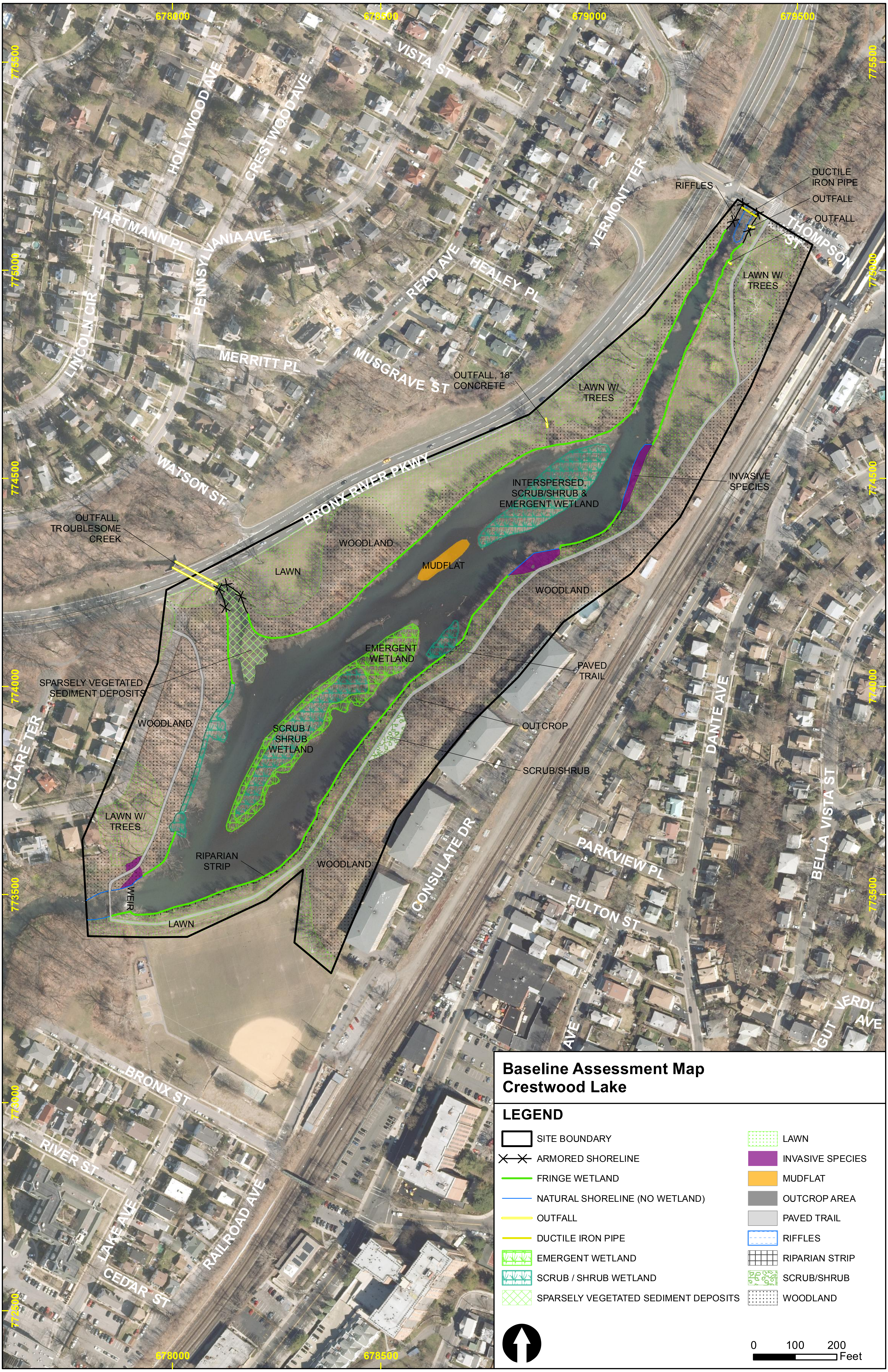
Baseline Assessment Map
Bronxville Lake

LEGEND

- SITE BOUNDARY
- ARMORED SHORELINE
- NATURAL SHORELINE (NO WETLAND)
- OUTFALL
- EMERGENT WETLAND
- EROSION
- INVASIVE SPECIES
- LAWN
- MUDFLAT
- OUTCROP AREA
- PAVED TRAIL
- RIPARIAN STRIP
- SPARSELY VEGETATED
- WOODLAND

0 150 300 Feet

Site 852. Crestwood Lake

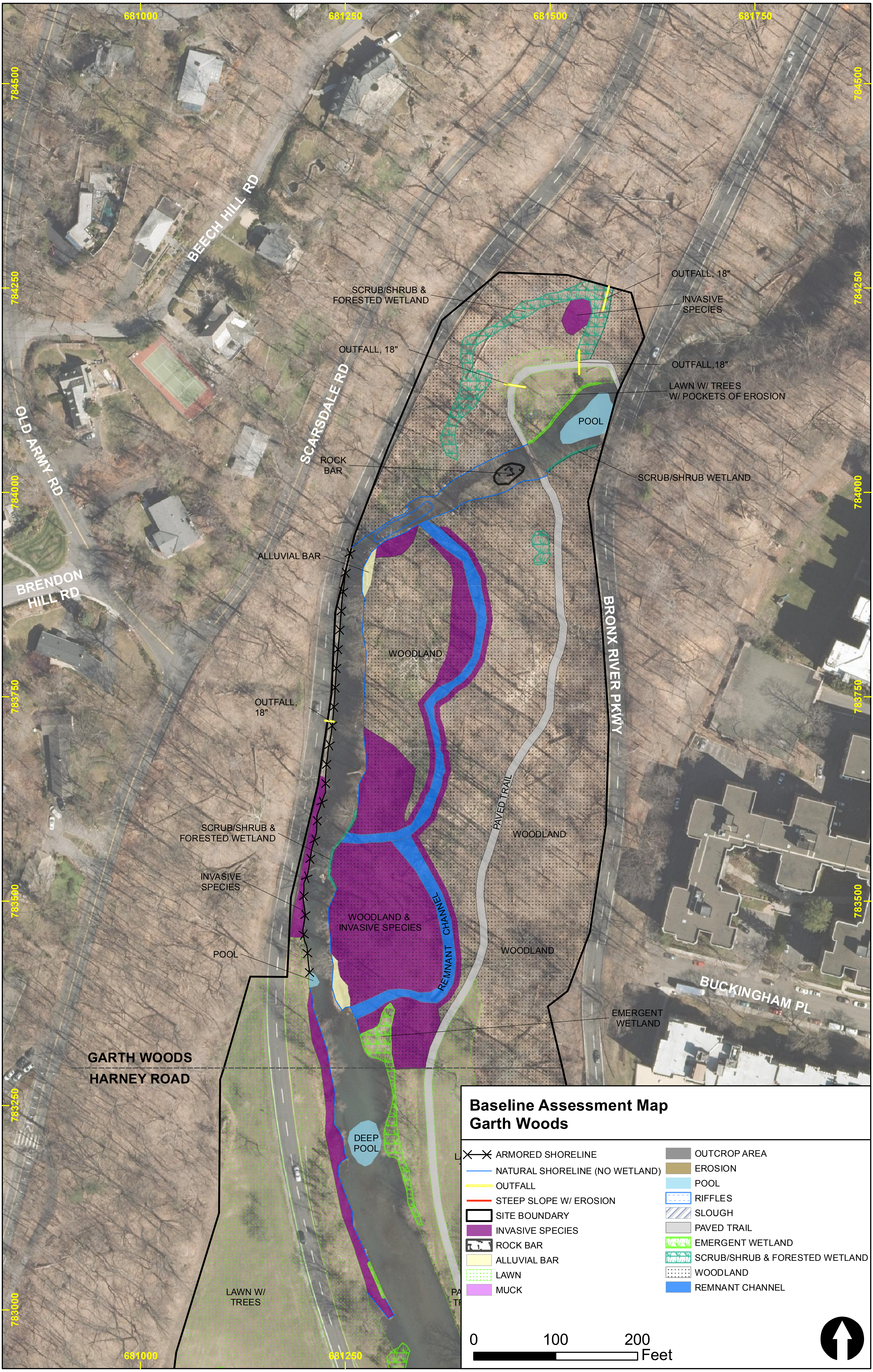


Baseline Assessment Map
Crestwood Lake

LEGEND

▭ SITE BOUNDARY	▨ LAWN
✕—✕ ARMORED SHORELINE	🟪 INVASIVE SPECIES
— FRINGE WETLAND	🟧 MUDFLAT
— NATURAL SHORELINE (NO WETLAND)	■ OUTCROP AREA
═ OUTFALL	▭ PAVED TRAIL
— DUCTILE IRON PIPE	▭ RIFFLES
▨ EMERGENT WETLAND	▦ RIPARIAN STRIP
▨ SCRUB / SHRUB WETLAND	▨ SCRUB/SHRUB
▨ SPARSELY VEGETATED SEDIMENT DEPOSITS	▨ WOODLAND

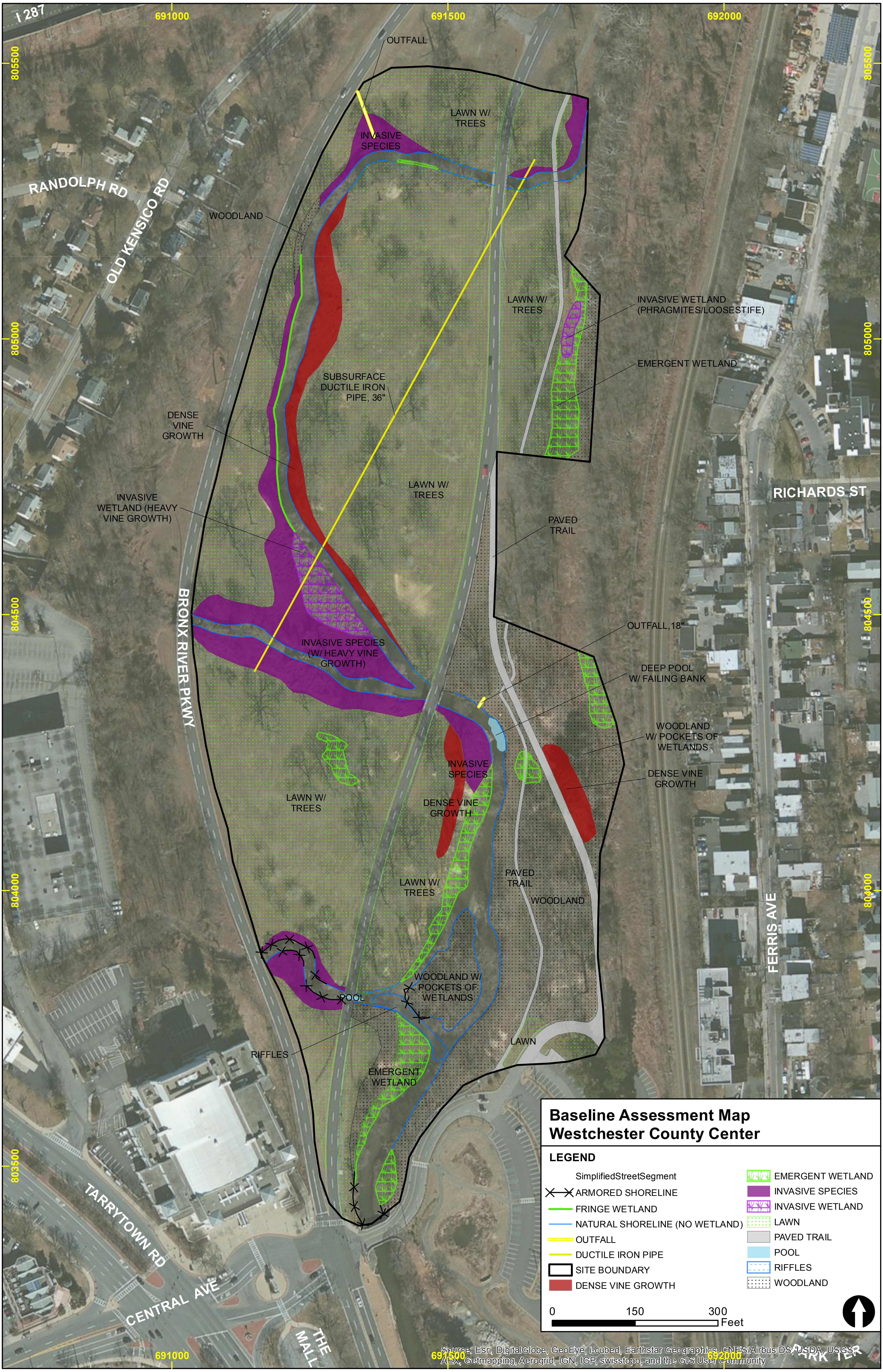
Site 853. Garth Woods and Harney Road



Baseline Assessment Map
Garth Woods

Baseline Assessment Map
Harney Road

Site 854. Westchester County Center



Baseline Assessment Map
Westchester County Center

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Attachment F
Uniqueness/Heritage Site Information

Appendix G

Uniqueness and Heritage Site Information

Appendix G - Uniqueness and Heritage Site Information

Cultural/Historic Resources

USACE Baseline Study Review

In March 2007, the U.S. Army Corps of Engineers (USACE), New England District (NAE) prepared the *Cultural Resources Baseline Study Bronx River Ecosystem Restoration Study, Westchester and Bronx Counties, New York*[1] (Baseline Study) for the USACE New York District (District). The Baseline Study area began at the Kensico Reservoir in Westchester County and ended at the confluence of the Bronx River with the East River in Bronx County. Previously identified cultural resources, including properties listed in or eligible for listing in the National Register and sites described in previous archaeological surveys in the Bronx River vicinity, were also identified within a one (1)-mile zone on either side of the Bronx River.

The primary purpose for conducting the background research and developing the environmental, prehistoric, and historic contexts was to assess whether proposed ecological restoration actions had the potential to affect previously identified cultural resources that are listed in or eligible for listing in the National Register, as well as assess the potential for encountering significant, intact archaeological resources. The Baseline Study also made recommendations to avoid or minimize impacts to cultural resources, and made preliminary recommendations for additional investigations, including intensive archaeological surveys.

The Baseline Study identified sixteen (16) known prehistoric archaeological sites in Westchester County and six (6) prehistoric archaeological sites in Bronx County. It should be noted that the Baseline Study's search area encompasses a one (1)-mile zone along both banks of the entire Bronx River; these previously identified sites were located within this large search area. The Bronx River Ecosystem Restoration Feasibility Study is concerned with only portions of the Baseline Study search area, namely the ten (10) discrete project site locations. As most of the potential actions that could be recommended under the Bronx River Ecosystem Restoration Feasibility Study would involve subsurface ground disturbance and could impact National Register-listed, National Register-eligible, and/or potential intact archaeological resources in the ten (10) Feasibility Study site locations, the USACE NAE Study was reviewed to establish applicable information for these ten (10) specific sites; this information is described below.

As mentioned in the Baseline Study, it should be noted that in addition to prehistoric populations, the Bronx River has been utilized by post-contact populations since the early-17th century. Many of the industries that have contributed to the ecosystem problems on the Bronx River have remnants of factories, dams or archaeological resources that are or could be considered significant.

The Baseline Study describes the conditions in the Bronx River search area as a mix of suburban and urban development, with major changes in channel and flow from construction of the Bronx River Parkway and industries downstream. The Baseline Study also states that while it appears that much of the Bronx River search area has been disturbed, there are areas that appear to be relatively unaltered. The Baseline Study states that the archaeological potential of the Base Study search area is moderate to high and any restoration project that would require excavation, plantings, changes in channel morphology, or restoration of salt or freshwater wetlands could impact archaeological resources.

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[1] *Atwood, Kathleen A., Marcos A. Paiva, and Saji Varghese (U.S. Army Corps of Engineers, New England District). 2007. Cultural Resources Baseline Study, Bronx River Ecosystem Restoration Study, Westchester and Bronx Counties, New York. Prepared for: U.S. Army Corps of Engineers, New York District.*

The Baseline Study indicates that each proposed restoration site would need to be evaluated on a case-by-case basis for archaeological and historic sensitivity based on the actions associated with the restoration techniques chosen to be implemented at each location. Additional background research, evaluation, and historic or archaeological investigations may be required at each site, in consultation with the State Historic Preservation Office (SHPO).

Preliminary recommendations were put forth in Chapter 8 of the Baseline Study, including implementation of the Section 106 process. This chapter also summarizes the potential ecosystem restoration techniques for potential ecosystem restoration areas within the larger search area in terms of their effect on cultural resources. Taken directly from Chapter 8, the following paragraphs explain the recommended Section 106 process:

> "Preliminary cultural resource investigations will be conducted for all proposed project locations. The initial surveys will include background research followed by limited fieldwork consisting primarily of pedestrian survey. The site survey report will provide information on potential cultural resources and will guide the need for, and direction of, further cultural resource investigations.
>
> Locations identified as sensitive for cultural resources will be investigated further through additional research and fieldwork. Fieldwork may entail subsurface testing, morphological sampling and remote sensing. The fieldwork will be tailored to each alternative proposed and will be based on site topography, fill depths, anticipated resources, and proposed project actions. If resources are identified, their eligibility for listing on the National Register of Historic Places will be evaluated. Recommendations will be made for avoiding significant sites and possible mitigation measures will be suggested, if sites cannot be avoided.
>
> If eligible resources are encountered, and cannot be avoided by project plans, then a MOA [memorandum of agreement] must be developed based on the results of the cultural resource studies conducted for the project and on project plans as they develop. MOA preparation will be conducted by the New York District and will require coordination with SHPO and, possibly, the Advisory Council on Historic Preservation. Other interested parties may also be consulted. This task will not be required if no significant resources are encountered. Implementation of the MOA must be completed prior to the initiation of project construction."

The Study documented several historic resources along the River within the vicinity of the Bronx River Ecosystem Restoration Feasibility Study project sites:

- the millpond and dam (Scarsdale Falls) in Scarsdale for the Haubold Gunpowder mill;
- Swain's Cutlery mill in Bronxville;
- the tapestry mill in Williamsbridge just north of Gun Hill Road;
- the Stone Mill (also called Snuff Mill) and dam established by Pierre Lorillard, now in the New York Botanical Gardens;
- the Bronx Bleach Works and Cloth Tape Factory, now within the Bronx Zoo; and
- DeLancey's Mills near East 180th Street, operating as a saw and grist mill as early as c. 1650, with a dam still present across the Bronx River.

Further detailed information regarding these documented historic resources and their relationship to the project sites is provided below. It should be noted that is also possible that additional unknown historic resources could be present along the existing banks of the Bronx River.

Site-Specific Information for the Bronx River Ecosystem Restoration Feasibility Study

The ten (10) Bronx River Ecosystem Restoration Feasibility Study project sites in Westchester and Bronx counties vary in size (acreage) and environmental setting across the Bronx River corridor. Although some of the sites possess moderate to high potential for archaeological resources, others do not. Muskrat Cove and Shoelace Park sites in Bronx County and the Westchester County Center site have low archaeological potential considering the extent of prior earth moving and ground disturbance due to highway building, railroad building, and other infrastructure improvements bordering the Bronx River at these locations. The seven (7) other restoration sites retain the potential for encountering significant archaeological resources.

The Bronx River Parkway, from its intersection with Sprain Brook Road to and including the Kensico Dam Plaza in Westchester County is listed in the National Register of Historic Places as the Bronx River Parkway Reservation, and includes dozens of contributing elements including bridges and buildings. Located within the Bronx River Parkway Reservation, the ten (10) sites will need to be further reviewed for their potential effects on contributing elements of the National Register-listed Reservation, as well as on individually listed historic architectural resources, such as the Stone Mill (also called Snuff Mill) Building in the New York Botanical Garden in Bronx County.

In compliance with Section 106 of NHPA and NEPA, each of the proposed restoration sites need to be evaluated on a case-by-case basis for archaeological and historic architectural sensitivity based on the actions associated with the restoration techniques chosen to be implemented at each location. A site-specific listing of known and potential cultural resources to date, as well as the archaeological potential, is provided below. This information was used as the basis for most of the scoring for the Evaluation for Planned Wetlands (EPW) Uniqueness/Heritage Function. It should be noted that all the sites are within or adjacent to County or City parks.

- Site 860 – Bronx River Park. DeLancey's Mill Dam is located at the northern end of Bronx River Park, near East 180th Street; adjacent to southern section of Bronx Zoo. Location utilized for water power as early as 1680 by William Richardson; passed to William Provost in 1711; to Stephen de Lancey in 1735; David Lydig family owned and operated mills just downstream until 1845. The dam is considered an important local historic resource by the Historic Districts Council.

  Cultural Resources in Immediate Vicinity: National Register-listed and New York City Individual Landmark building at East 180th Street and Morris Park Avenue, the former New York, Westchester and Boston Railroad Administration Building. New York City Individual Landmark West Farms Soldiers Cemetery at East 180th Street and Bryant Avenue. Shell heaps indicating prehistoric activity were noted on the east bank of the Bronx River south of DeLancey's Mills on the Junior League of Westchester and Westchester County Historical Society (WCHS) 1978 Westchester Heritage Map of Indian Occupation, Colonial and Revolutionary Names, Structures and Events.

  Archaeological Potential: moderate to high.

- Site 861 – Bronx Zoo and Dam. C. 1818, James Bolton constructed a large dam, Bolton's Mill Dam, and established a bleach works and cloth tape factory on the Bronx River in what is now the Bronx Zoo. A settlement known as Bronxdale developed on the east side of the river, which was erased by the creation of Bronx Park and the Bronx Zoo at the end of the 19th century.

Cultural Resources in Immediate Vicinity: New York City Individual Landmark Baird (now Astor) Court portion of the Bronx Zoo lies to the west of the Bronx River and Bolton's Dam. A Late Woodland Period habitation site was reported in the vicinity of Fordham Road and the Bronx River – now within the Bronx Zoo, as noted on the WCHS 1933 Map of Westchester County Showing Indian Occupation.

Archaeological Potential: moderate to high.

- Site 862 – Muskrat Cove.

  Cultural Resources in Vicinity: None known.

  Archaeological Potential: low.

- Site 863 – Stone Mill Dam.

  Cultural Resources in Immediate Vicinity: The New York Botanical Garden is National Register-listed (90NR00041) and a National Historic Landmark. The Stone Mill (also called Snuff Mill) is National Register-listed (90NR00072) and a National Historic Landmark. The Stone Mill Dam, also called Snuff Mill Dam or Lorillard's Mill Dam, is not specifically mentioned in the NR Form, but it is within the viewshed of the Stone Mill (also called Snuff Mill) building and may lie within the NR boundary, which encompasses eight (8) acres. As noted in previous archaeological surveys, areas of prehistoric sensitivity have been identified within the New York Botanical Garden along the banks of the Bronx River.

  Archaeological Potential: moderate to high.

- Site 113 – Shoelace Park.

  Cultural Resources in Immediate Vicinity: National Register-listed and National Historic Landmark Woodlawn Cemetery is located on the west side of Webster Avenue, west of the Bronx River Parkway from E. 211th – E. 233rd Streets.

  Archaeological Potential: low.

- Site 851 – Bronxville Lake. Artificial Lake created in 1922 by damming the Bronx River.

  Cultural Resources in Immediate Vicinity: Prominent Landscape Feature A on the Bronx River Parkway Reservation (NR# 91NR03356) National Register Nomination Form.

  Contributing structures on NR Nomination form for Bronx River Parkway Reservation:
  3. Tuckahoe Road Bridge to north. Delano & Aldrich, architects. Original.
  2. Pondfield Road Bridge to south. Original.

  Extant foundation remains of Swain's Mill at south end of lake, west side of river: C. 1840, James P. Swain took over a large stone mill building from Lawrence Underhill. Swain operated a grist mill and a screw and axle manufactory.

  Archaeological Potential: moderate to high.

- Site 852 – Crestwood Lake. Artificial lake created by damming the Bronx River.

  Cultural Resources in Immediate Vicinity: Prominent Landscape Feature B on National Register Nomination Form.

  Contributing structures on NR Nomination Form for Bronx River Parkway Reservation:
  6. Thompson Street Bridge at north end of lake. Double bridge over parkway and river. Original.
  5. Parkway Viaduct. Bowdoin & Webster, architects. Original.
  4. Bridge between Scarsdale Road and Tuckahoe Road originally carrying northbound lane over River; now an access road bridge. Gilmore D. Clarke, architect. Original.

  Archaeological Potential: moderate to high.

- Site 853 – Garth Woods & Harney Road. Garth Woods is a virgin forest tract with paths and the only extant rustic pedestrian bridge.

  Cultural Resources in Immediate Vicinity: Prominent Landscape Feature C on National Register Nomination Form.

  Contributing structures on NR Nomination form for Bronx River Parkway Reservation:
  9. Bridge carrying northbound lane over river south of Harney Road. Original.
  10. Harney Road Bridge. Charles W. Stoughton, architect. Original.
  11. Slab bridge carrying northbound lane over river at Garth Road. Original.

  Archaeological Potential: moderate to high.

- Site 854 – Westchester County Center.

  Cultural Resources in Immediate Vicinity: The Westchester County Center (c.1927-c.1930) is a contributing resource to the National Register-listed Bronx River Parkway Reservation.

  Contributing structures on NR Nomination form for Bronx River Parkway Reservation:
  24. Access Road Bridge from County Center parking lot. Original.
  25. Bridge carrying northbound lane over Fulton Brook. Gilmore S. Clarke, architect. Original.
  26. Bridge carrying southbound lane over Fulton Brook. Gilmore S. Clarke, architect. Original.
  27. Bridge carrying northbound lane over Manhattan Brook. Gilmore S. Clarke, architect. Original.
  28. Bridge carrying southbound lane over Manhattan Brook. Gilmore S. Clarke, architect. Original.
  29. Bridge carrying northbound lane over River north of Manhattan Brook. Charles W. Stoughton, architect. Original.

  Archaeological Potential: low to moderate.

- Reference Site – Mianus River. The Minaus River Gorge reference site was not included in the Baseline Survey search area as it is a separate River from the Bronx River. However review of the SHPO's online mapping website indicated that there are no known historical architectural or archaeological resources on the site.

Recommendations for Next Steps for the Bronx River Ecosystem Restoration Feasibility Study

The recommendations given for next steps forward with regard to cultural resources that may be affected by the ten sites currently being considered for restoration are the same as those put forth in the Baseline Study. Phase IA cultural resource investigations would need to be conducted for all ten (10) sites being considered for restoration, consisting of background research and a site reconnaissance walkover to document existing conditions. The survey report would document the previously identified, as well as potential archaeological and historic architectural resources, on or in proximity to the ten (10) sites being considered for restoration and would recommend the need for additional cultural resources work, if necessary.

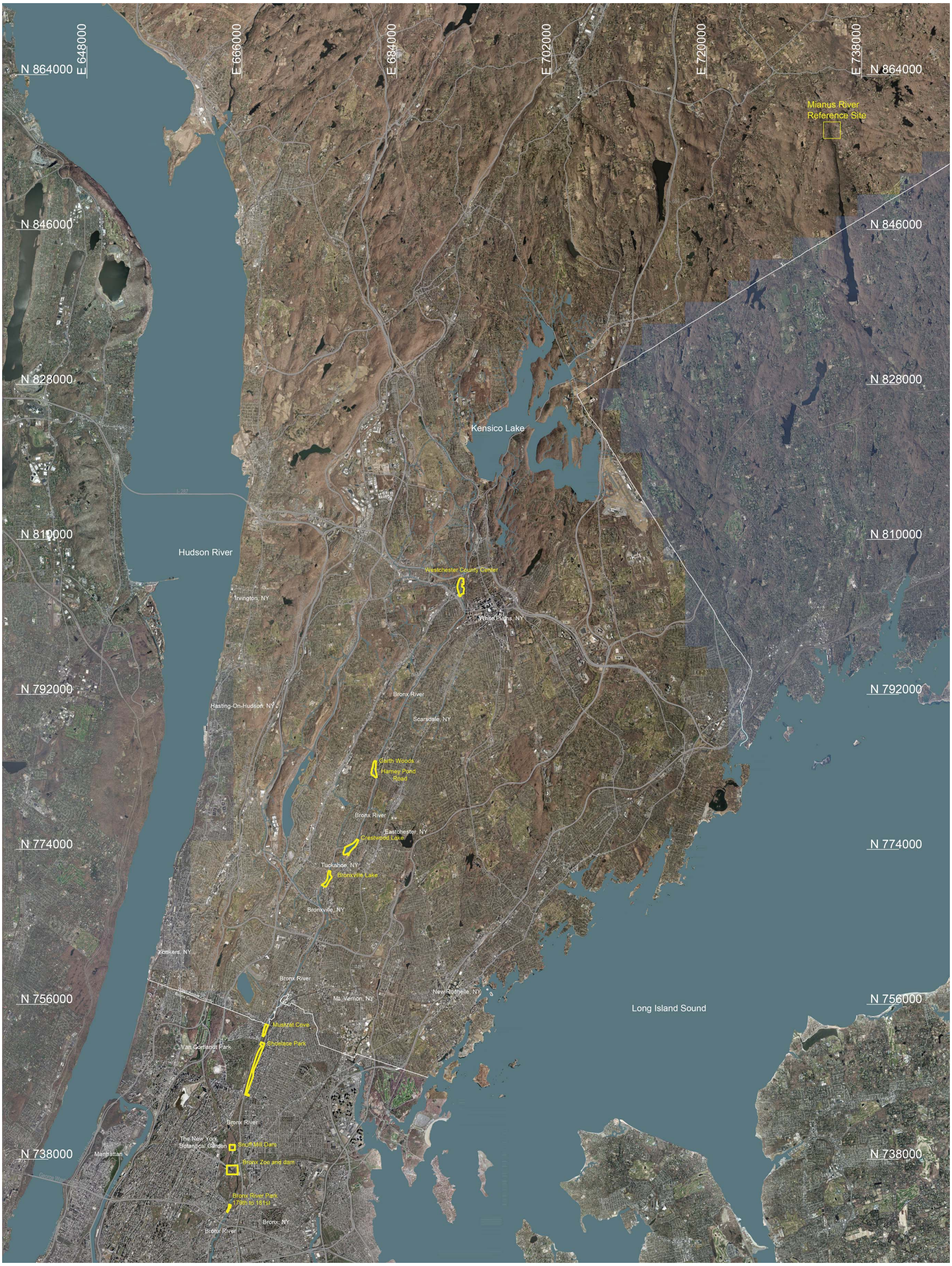
Locations identified as sensitive for cultural resources would be further investigated through additional research and fieldwork. Phase IB archaeological fieldwork could entail subsurface testing, geomorphological sampling, remote sensing or a combination of these sampling techniques. Historic architectural fieldwork could be required to develop National Register eligibility determinations of existing, but not yet evaluated resources, as well as an impacts assessment of project actions on listed or eligible for listing historic architectural resources.

If eligible archaeological or historic architectural resources are encountered, recommendations would be made for avoiding such resources. If the eligible resources cannot be avoided, then mitigation measures would be suggested and a MOA will be developed by the District in consultation with the SHPO, the Advisory Council on Historic Preservation, and other interested parties.

Endangered Species

To determine if threatened or endangered species or critical habits occur within on near the project sites, an information request letter was sent to the New York Natural Heritage Program (NYNHP). In a September 19, 2014 correspondence, the NYNHP indicated “We have no recent records of rare or state-listed animals or plants, or of significant natural communities, at these sites or in their immediate vicinity.” The NY NHP did indicate that there were historical sightings of several threatened and endangered species in the project. The rare plants and animals were documented in the vicinity of the project site at one time, but haven of been documented there since 1979 or earlier, and/or there is uncertainty regarding their continued presence (see Appendix F). Review of the information NHNHP provided in their 2014 report, the species were sighted between 1896 to1962. During the site visits in the summer of 2014, no threatened or endangered species were observed. The September 19, 2014 correspondence with NYNHP is included on the following page.

Attachment G
Photo Log



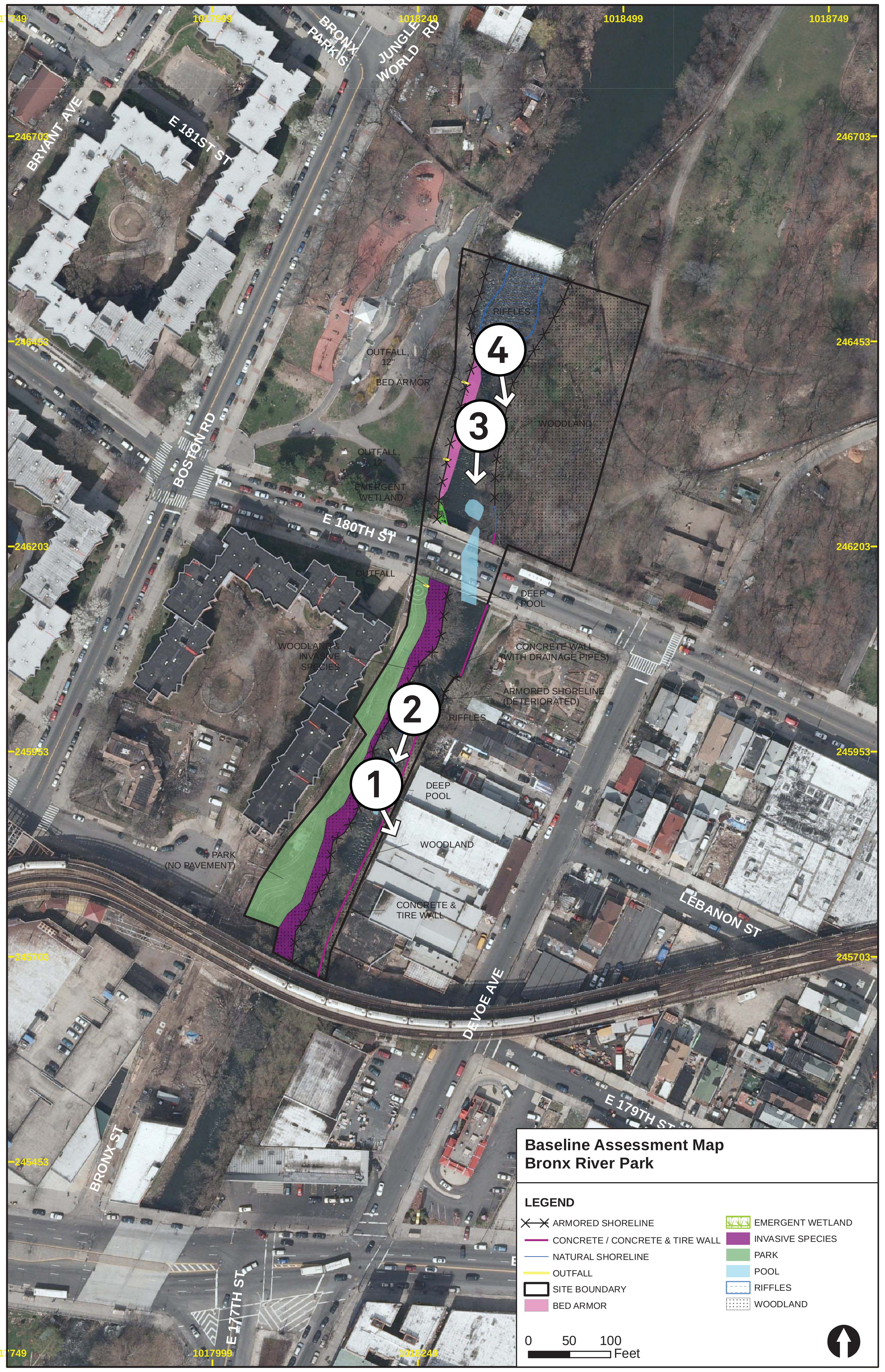
Bronx River Ecosystem Restoration Feasibility Study

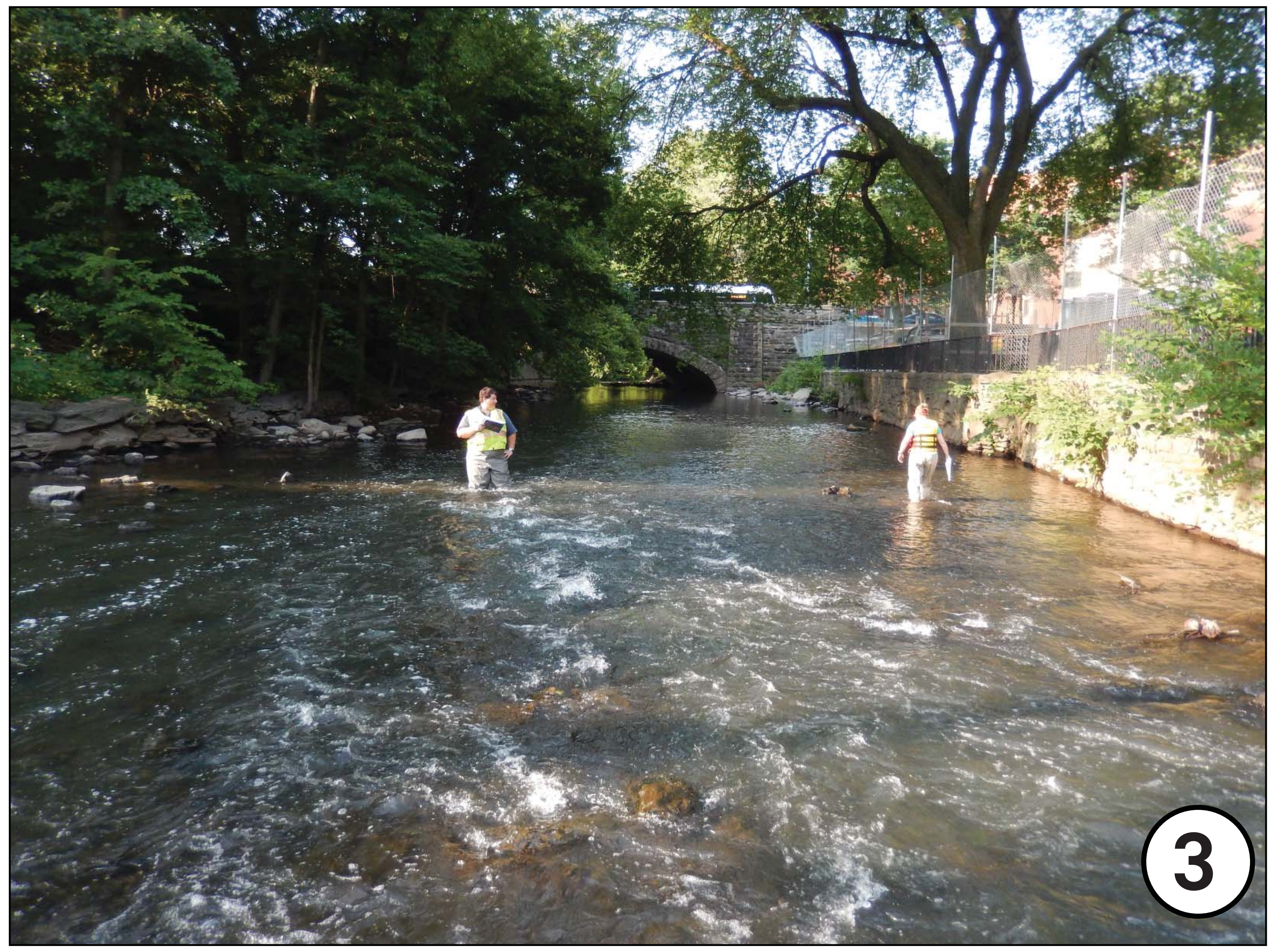
Prepared for: U.S. Army Corps of Engineers – New York District, New York City Department of Environmental Protection, & New York City Department of Parks and Recreation

Overall Project Location Map

21 Jul 2014: Concrete/tire wall, downstream east bank

21 Jul 2014: Downstream portion of site, looking downstream



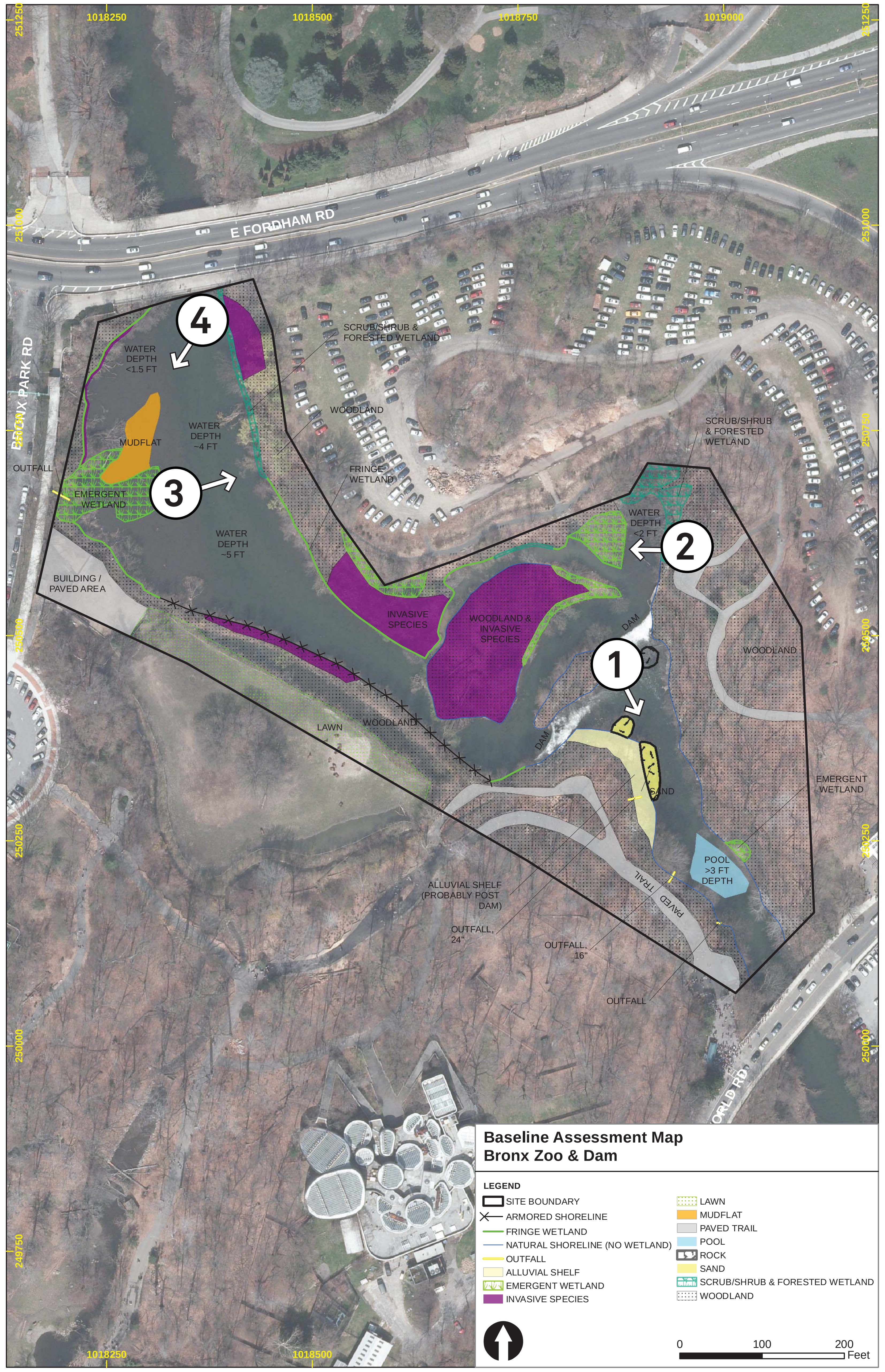


21 Jul 2014: Upstream portion of site, looking downstream

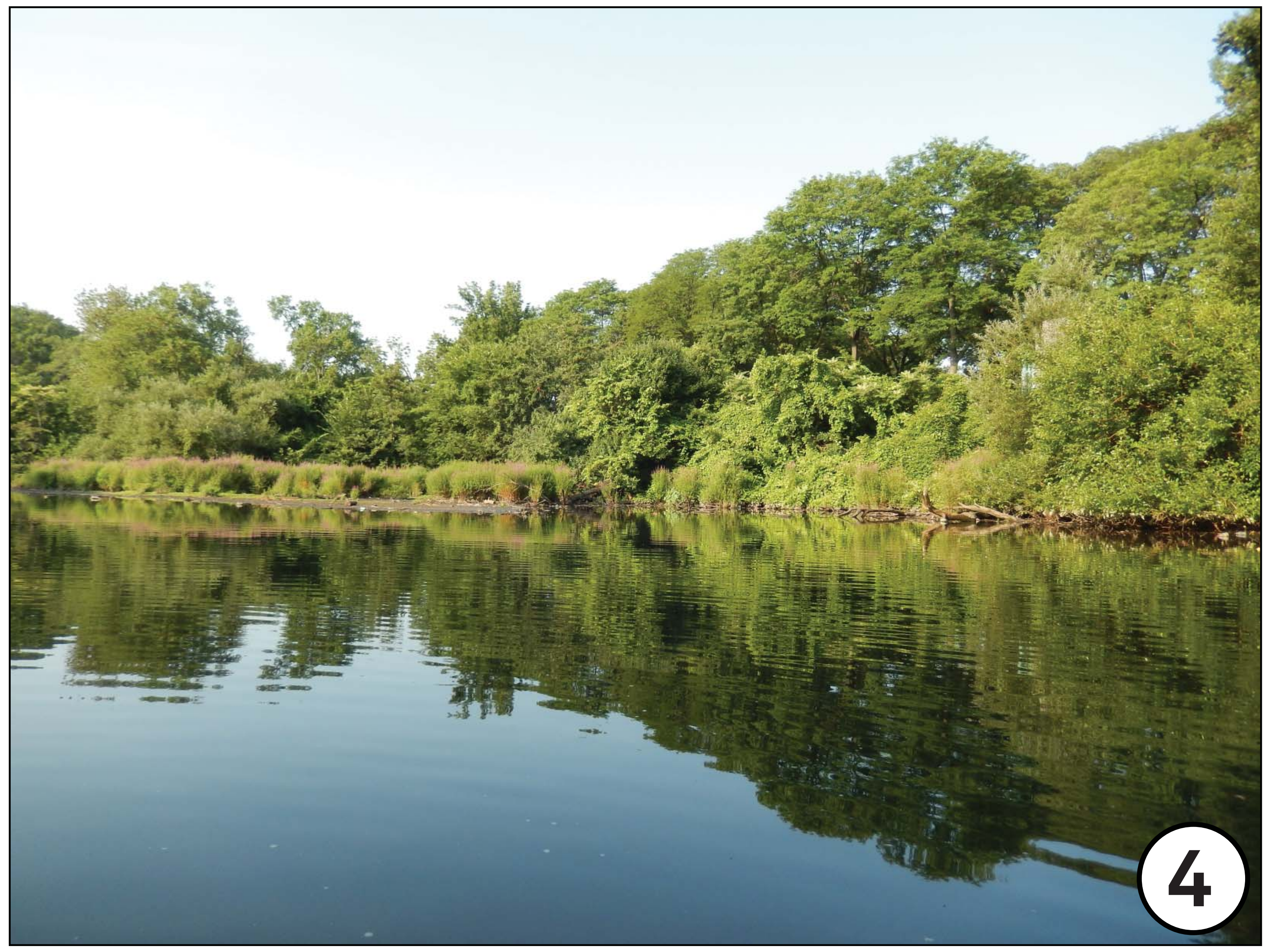
21 Jul 2014: Dilapidated armoring, upstream east bank

22 July 2014: Downstream portion of site below dams, looking downstream

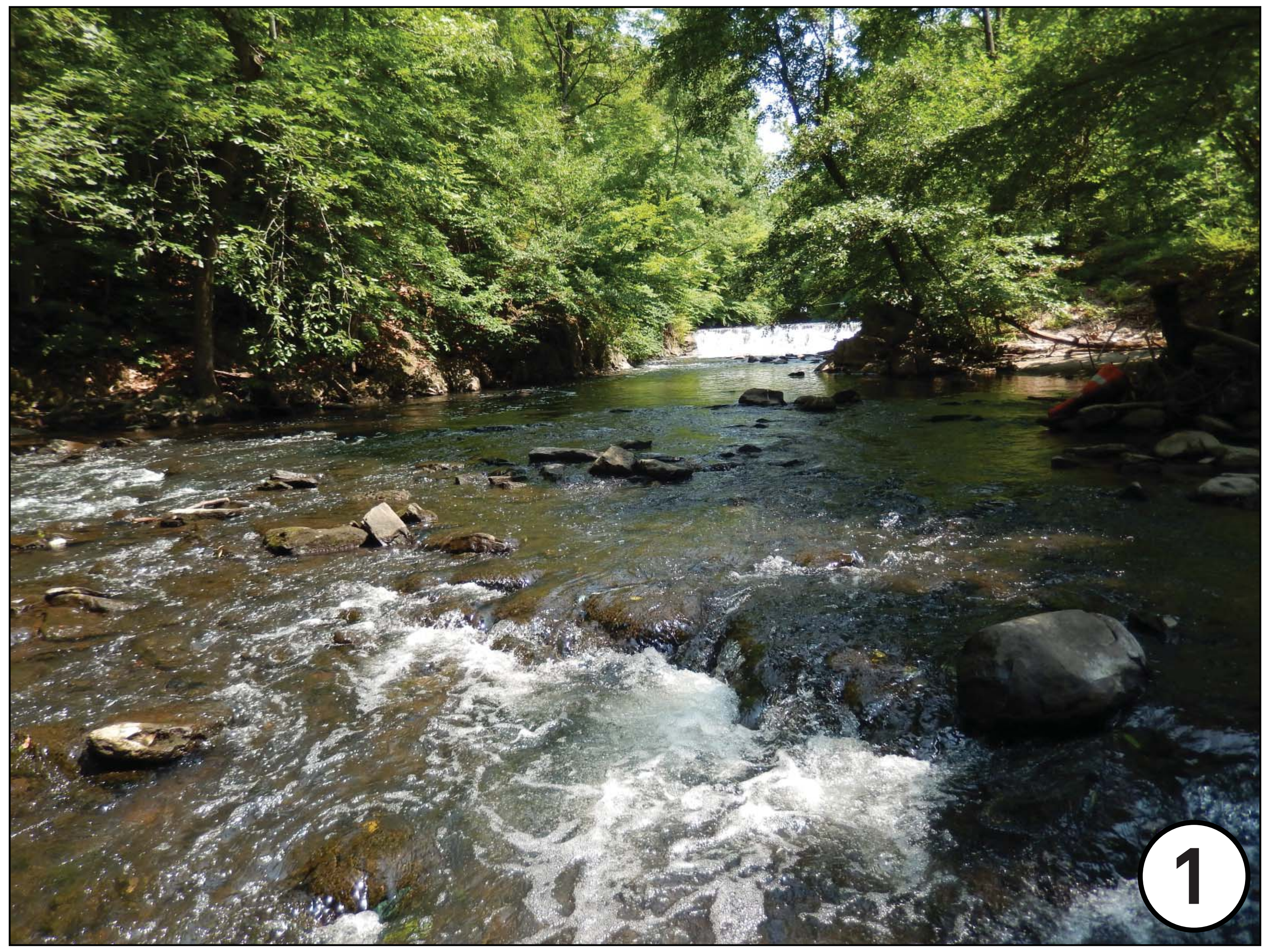
22 July 2014: Secondary channel and adjacent wetlands



22 July 2014: Eastern shoreline, upstream portion of site

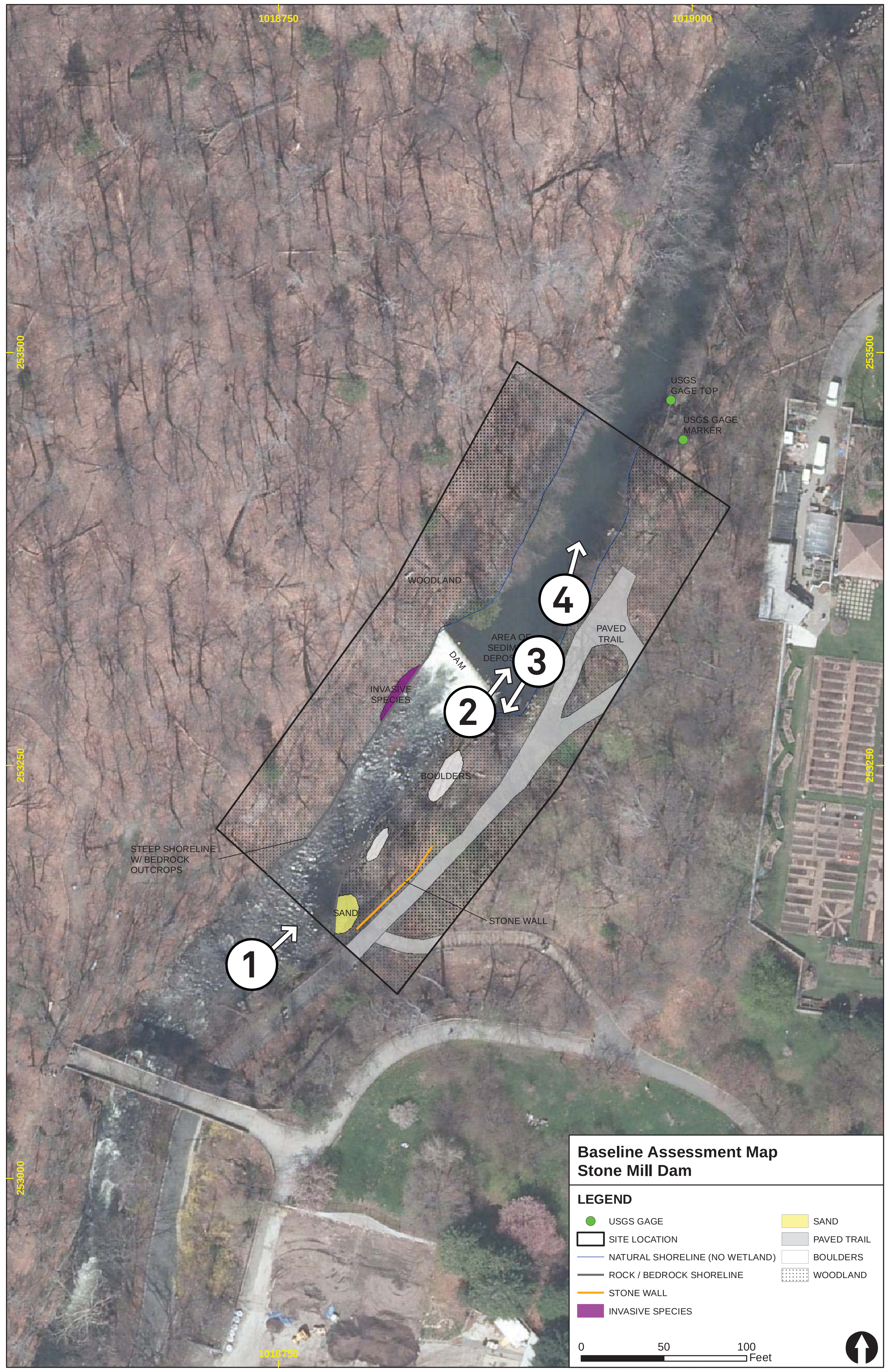


22 July 2014: Mudflat and wetland, upstream portion of site



21 Jul 2014: Downstream portion of site, looking upstream

21 Jul 2014: Proposed area of bed restoration above dam



21 Jul 2014: Above dam end location of fish ladder

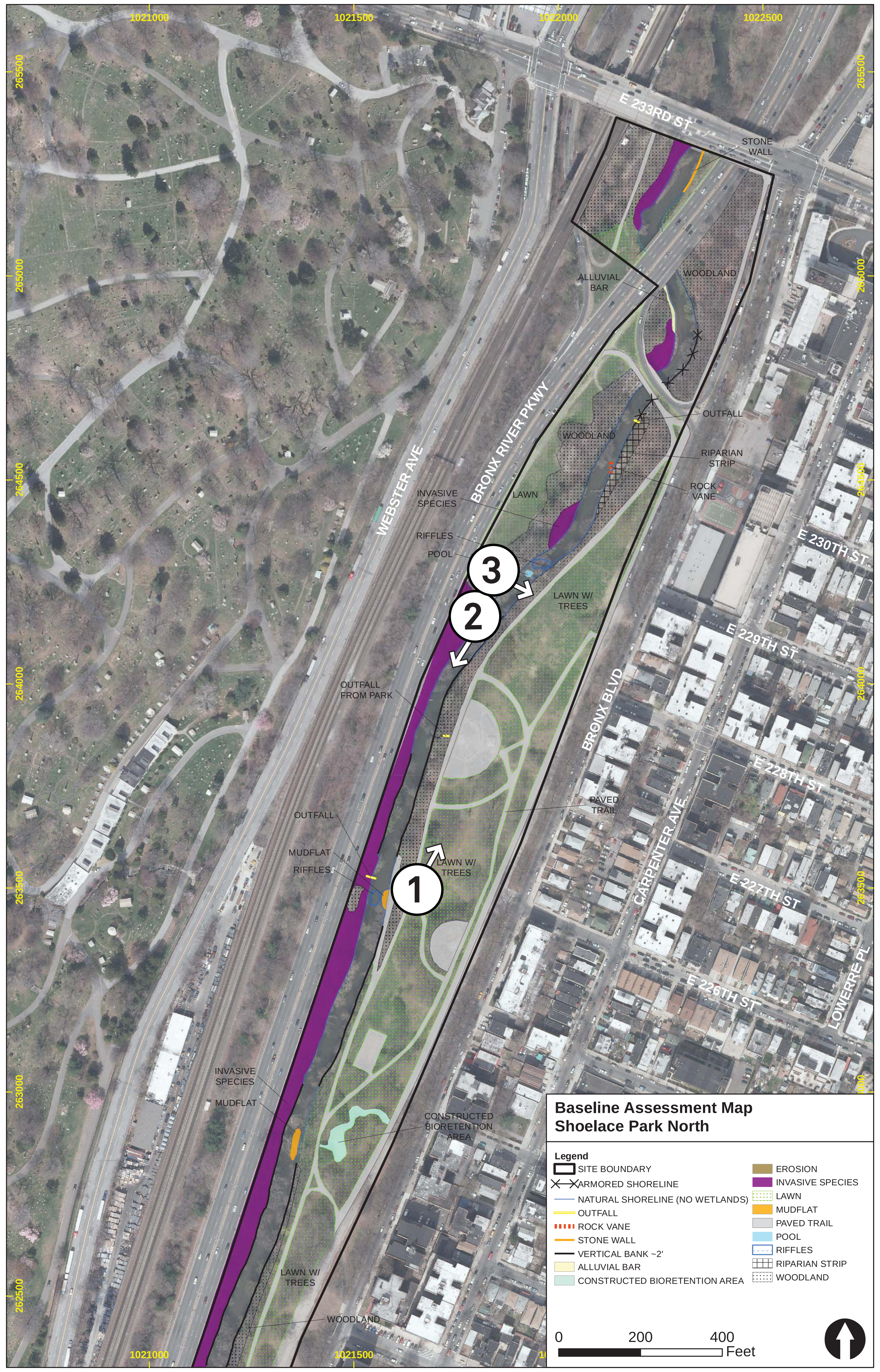
21 Jul 2014: Upstream portion of site, looking upstream

Stone Mill Dam Existing Conditions

January 2015

01 Jul 2014: Potential Bioretention in northern portion of site

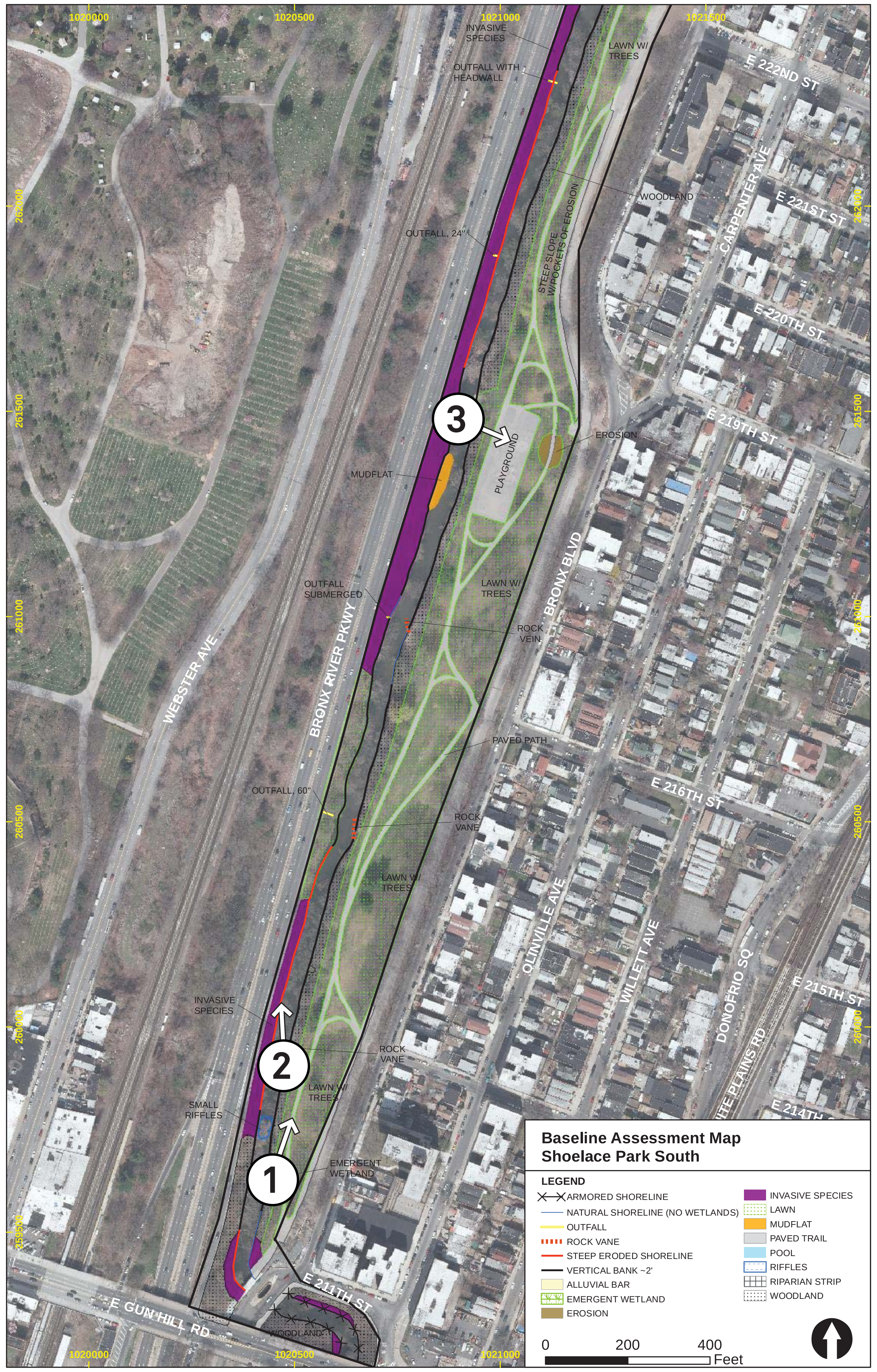
01 Jul 2014: Upstream portion of the site, looking downstream



01 Jul 2014: Existing cribwall

01 Jul 2014: Potential bioretention in southern portion of site

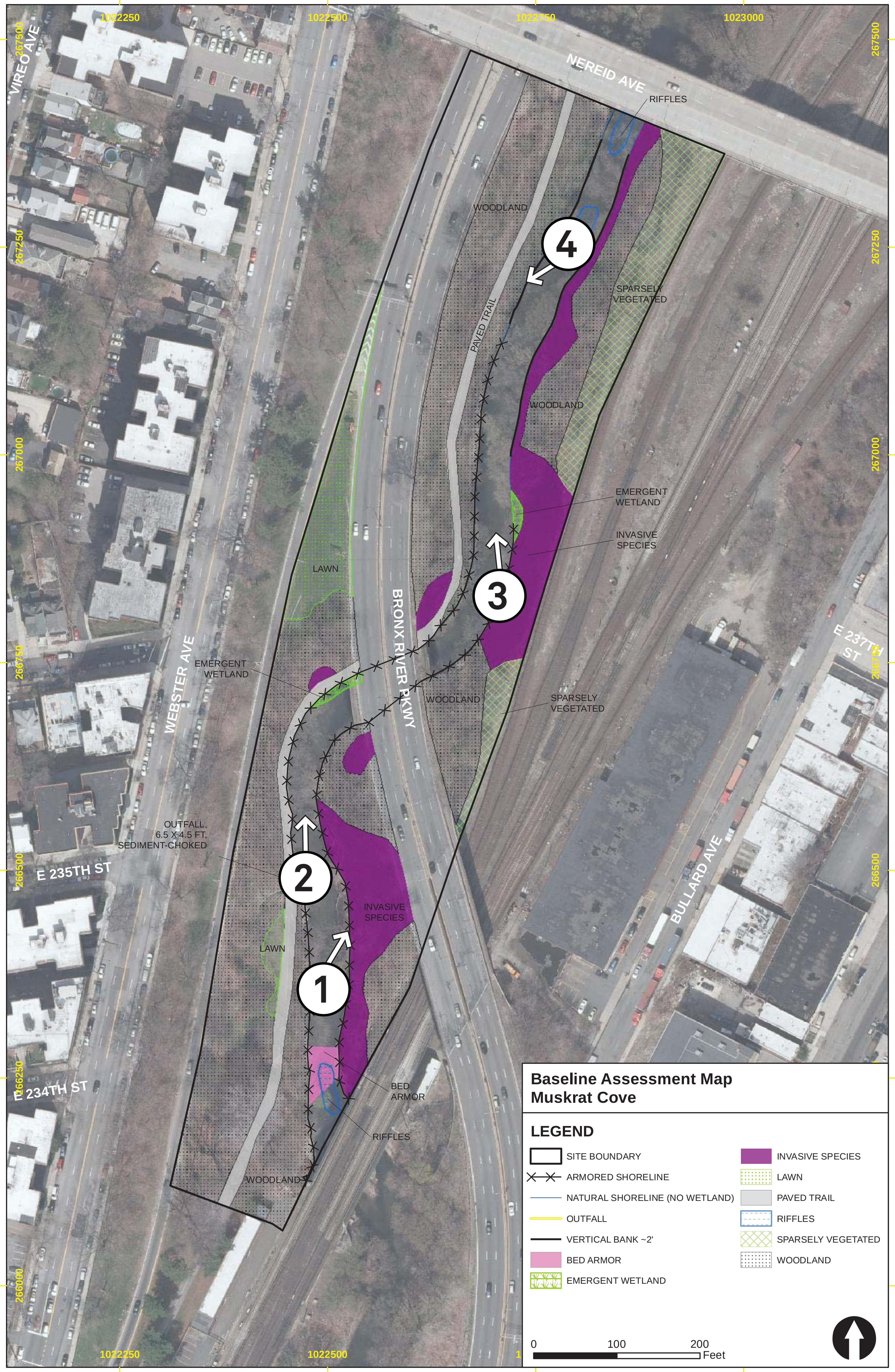
01 Jul 2014: Typical steep eroded shoreline



01 Jul 2014: Typical vertical bank

09 Jul 2014: Invasive species on eastern downstream bank

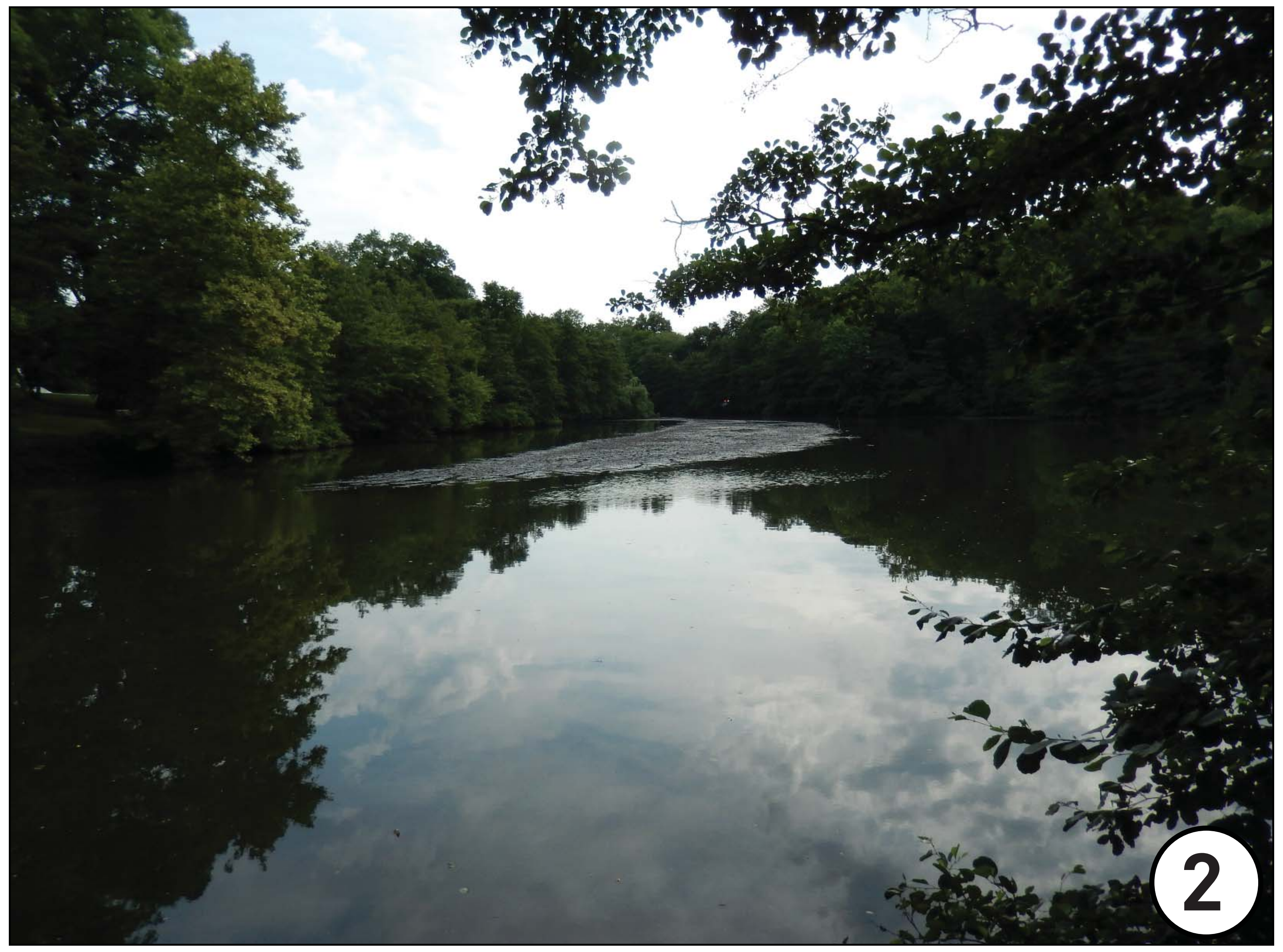
09 Jul 2014: Downstream portion of site, looking upstream



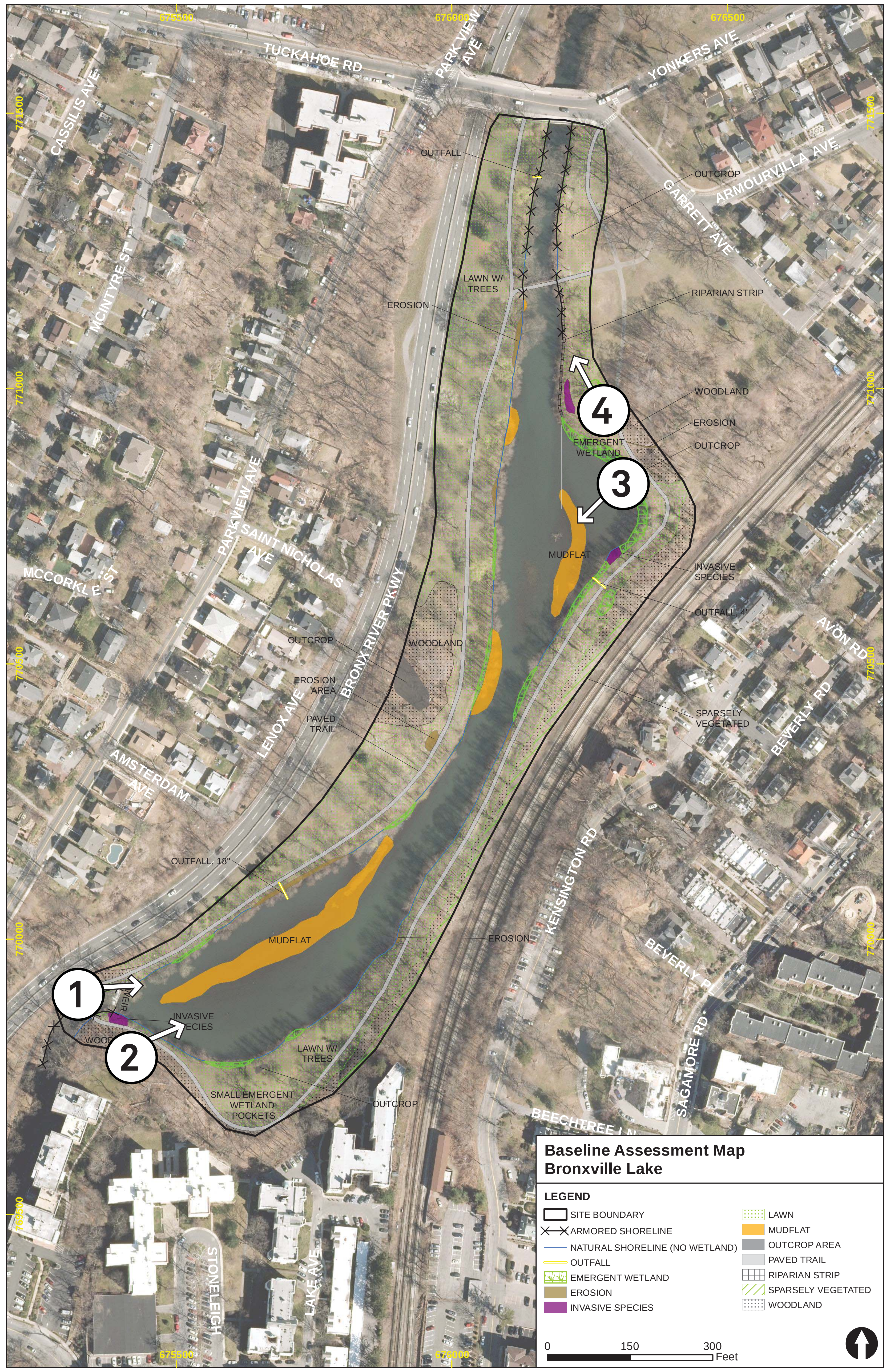
09 Jul 2014: Upstream portion of site, looking upstream

09 Jul 2014: Typical vertical bank upstream

10 Jul 2014: Existing weir



10 Jul 2014: Downstream portion of site, looking upstream

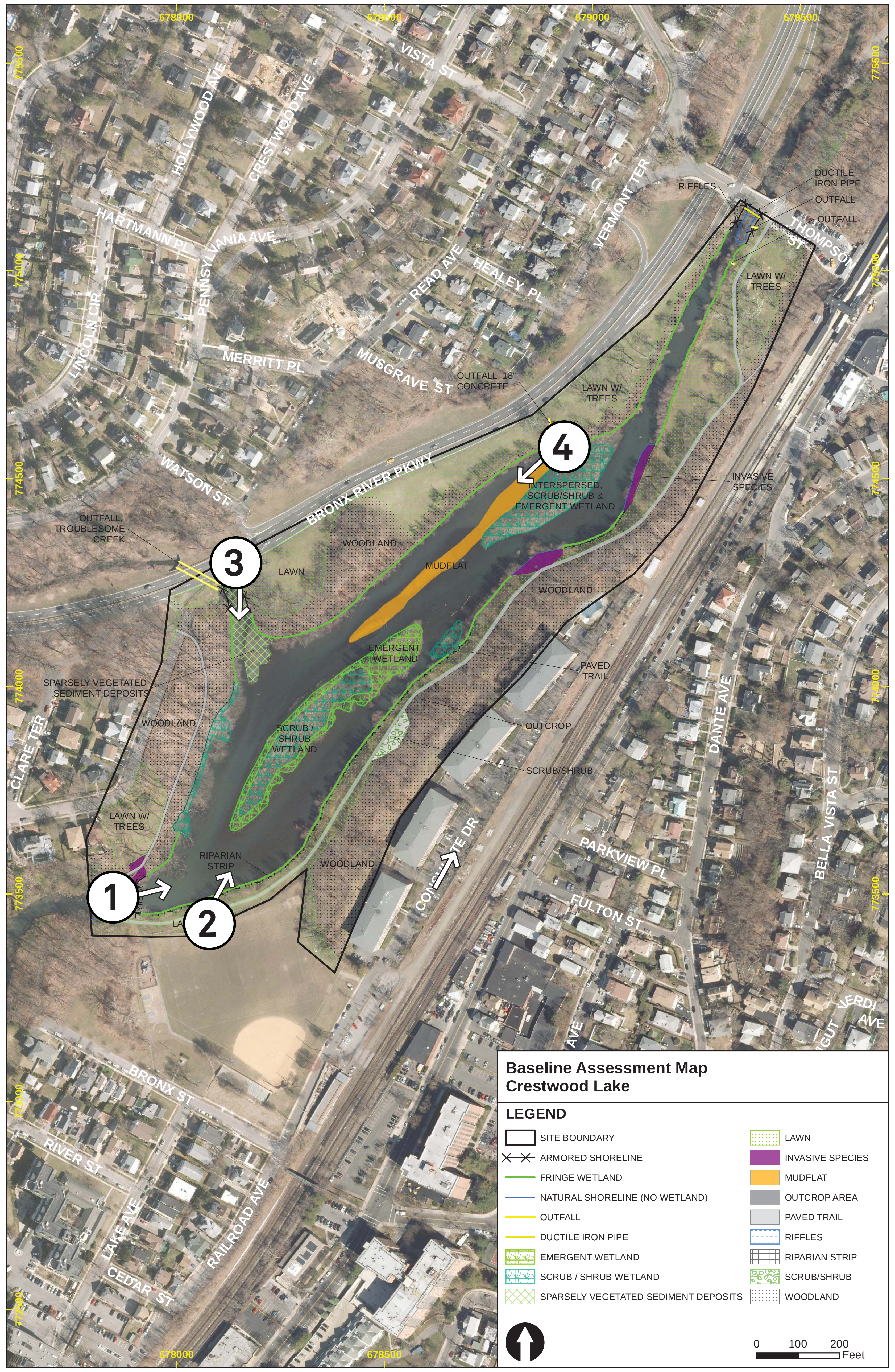


10 Jul 2014: Upstream portion of site, looking downstream

10 Jul 2014: Proposed wetland creation area

09 Jul 2014: Existing weir

09 Jul 2014: Downstream portion of site, looking upstream



09 Jul 2014: Troublesome Brook, looking downstream

09 Jul 2014: Proposed wetland creation area, looking downstream

Crestwood Lake Existing Conditions

February 2015

18 Jul 2014: Existing weir

18 Jul 2014: Typical channel section, looking upstream

18 Jul 2014: Proposed wetland creation area

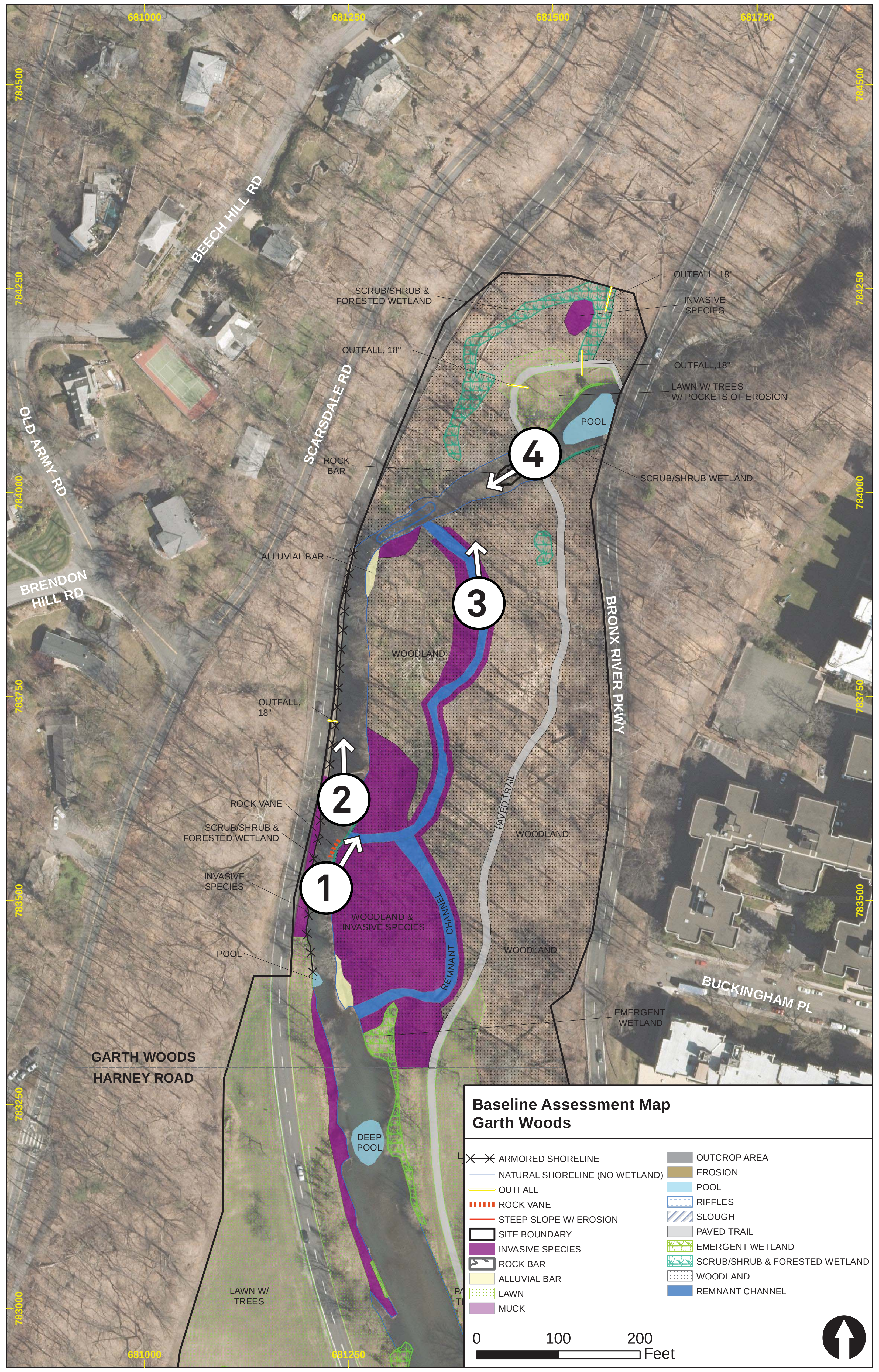
18 Jul 2014: View from path across channel

Harney Road Existing Conditions

February 2015

18 Jul 2014: In-stream structure near remnant channel confluence

18 Jul 2014: Downstream portion of site, looking upstream

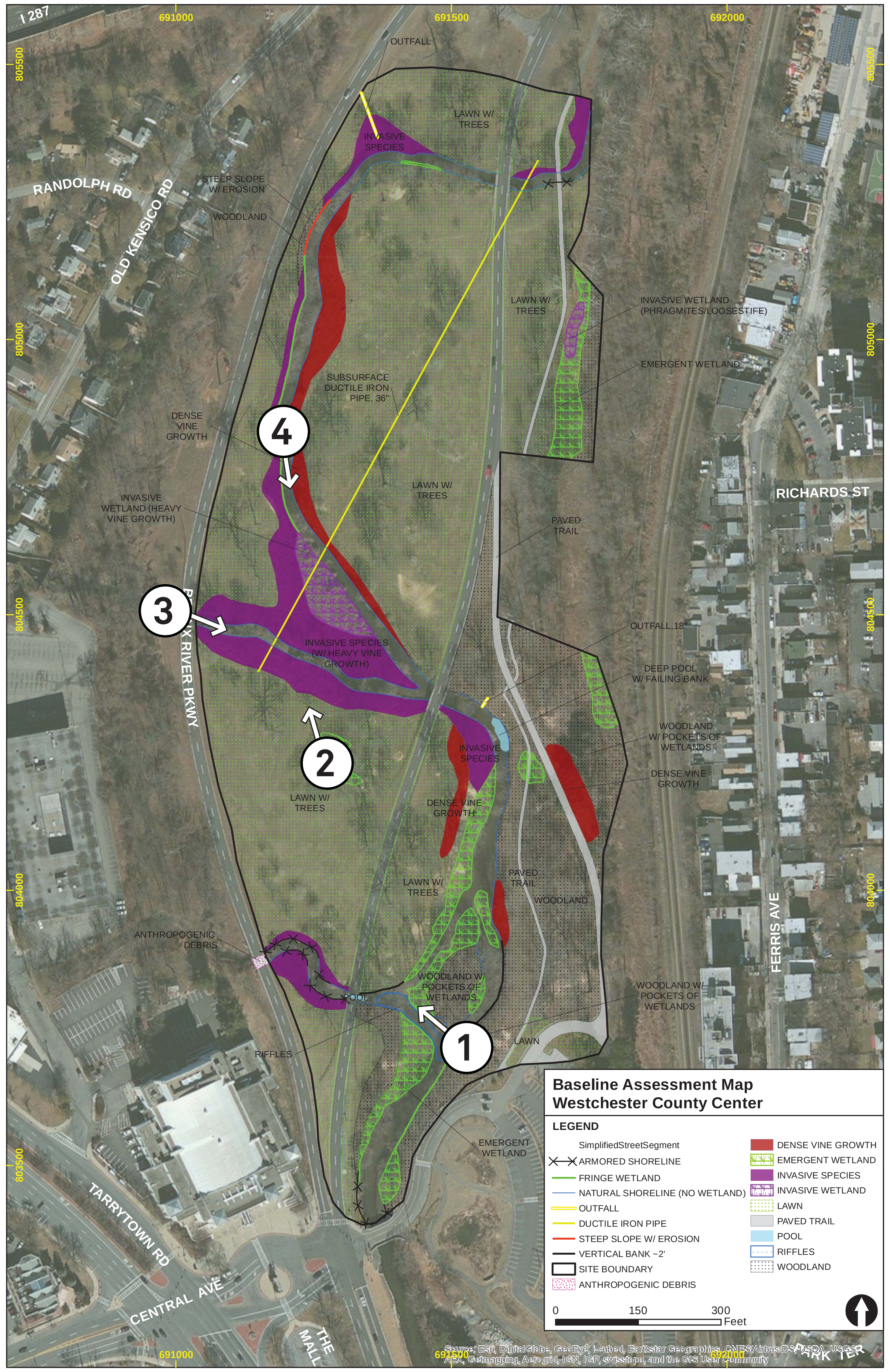


18 Jul 2014: Remnant channel

18 Jul 2014: Upstream portion of site, looking downstream

17 Jul 2014: Sedimentation at Fulton Brook confluence

17 Jul 2014: Proposed wetland area, looking north



17 Jul 2014: Manhattan Brook tributary, looking downstream

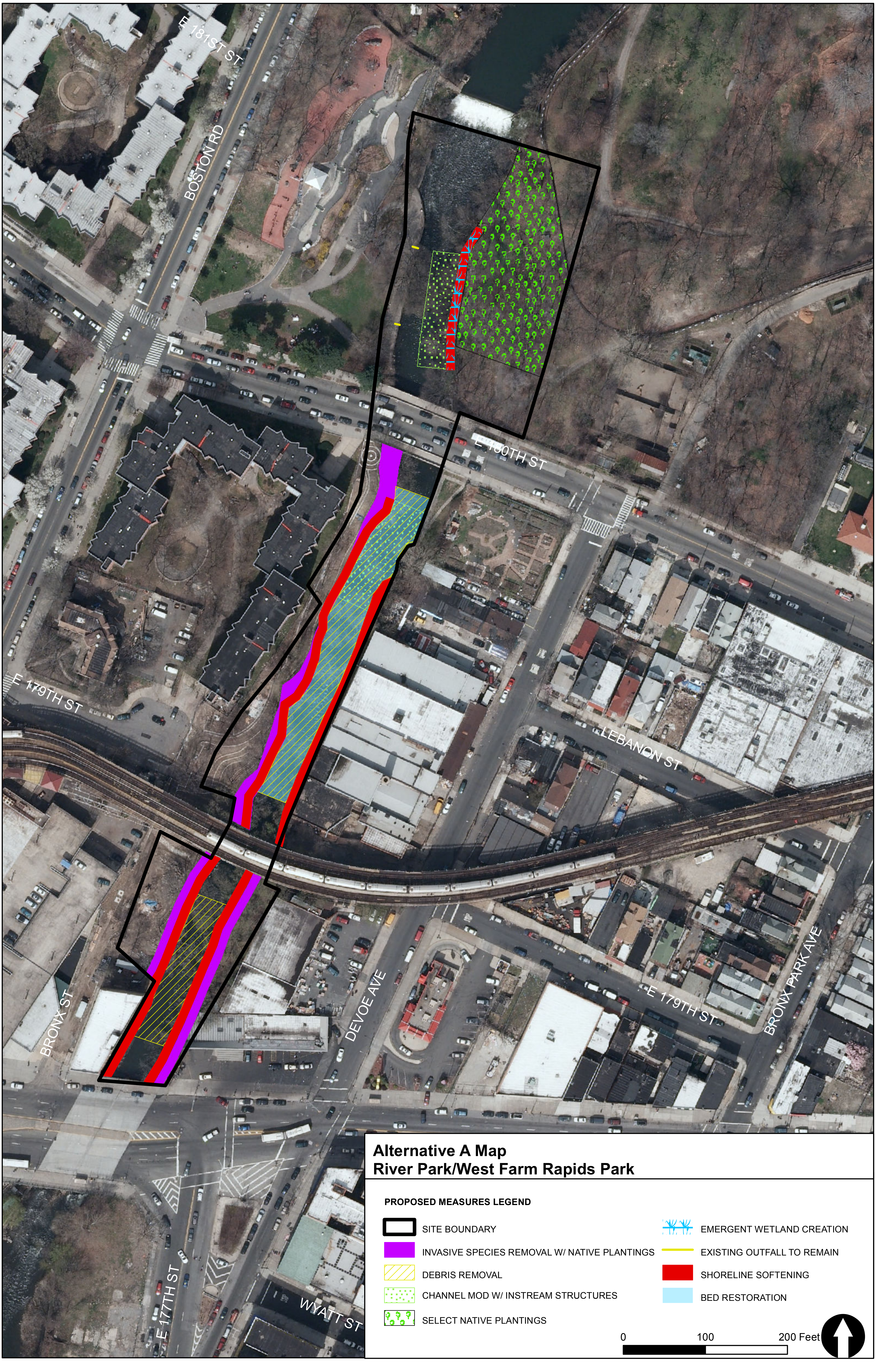
17 Jul 2014: Upstream portion of site, looking downstream

Westchester County Center Existing Conditions

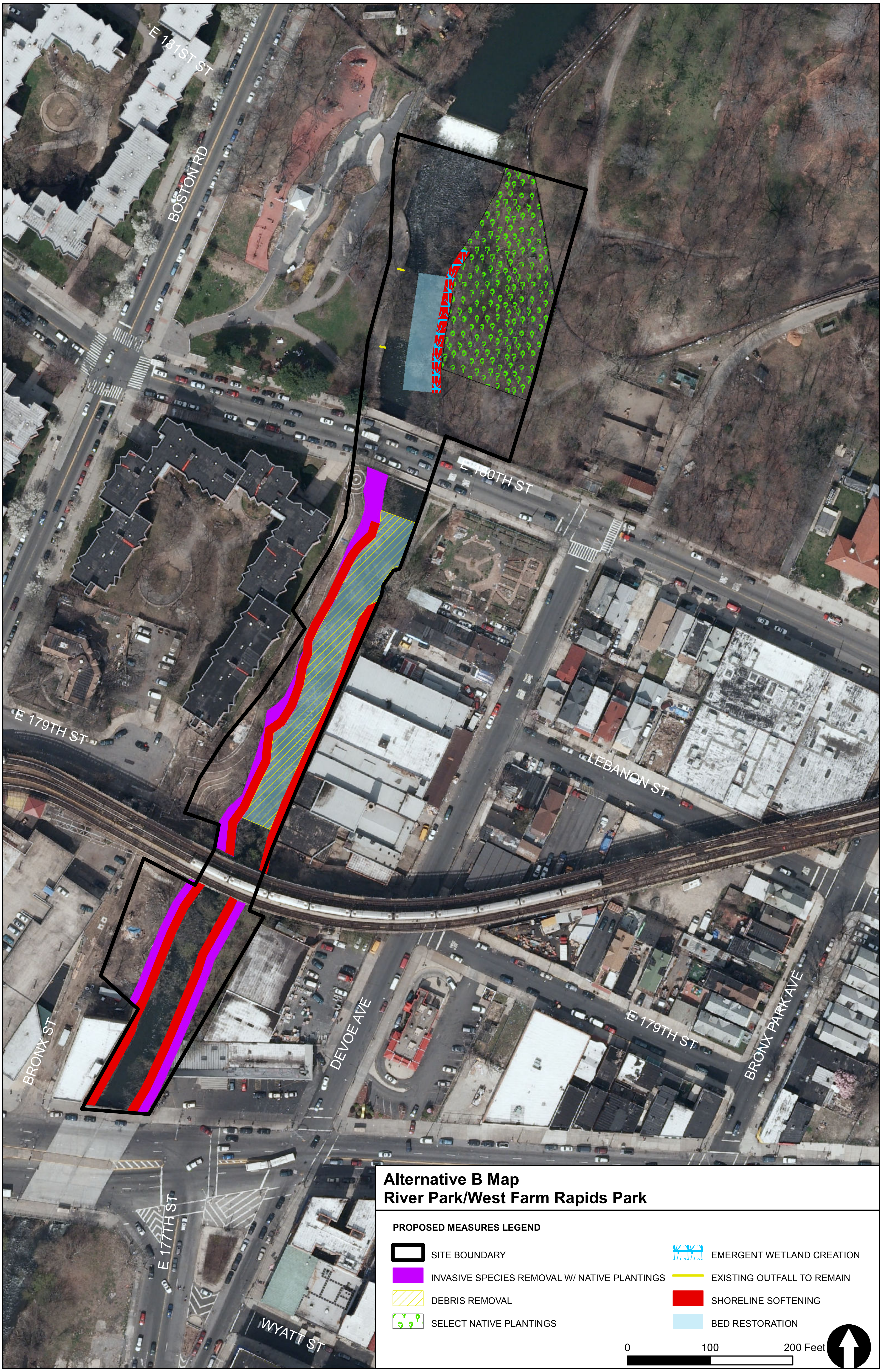
February 2015

Attachment H
Alternative Maps

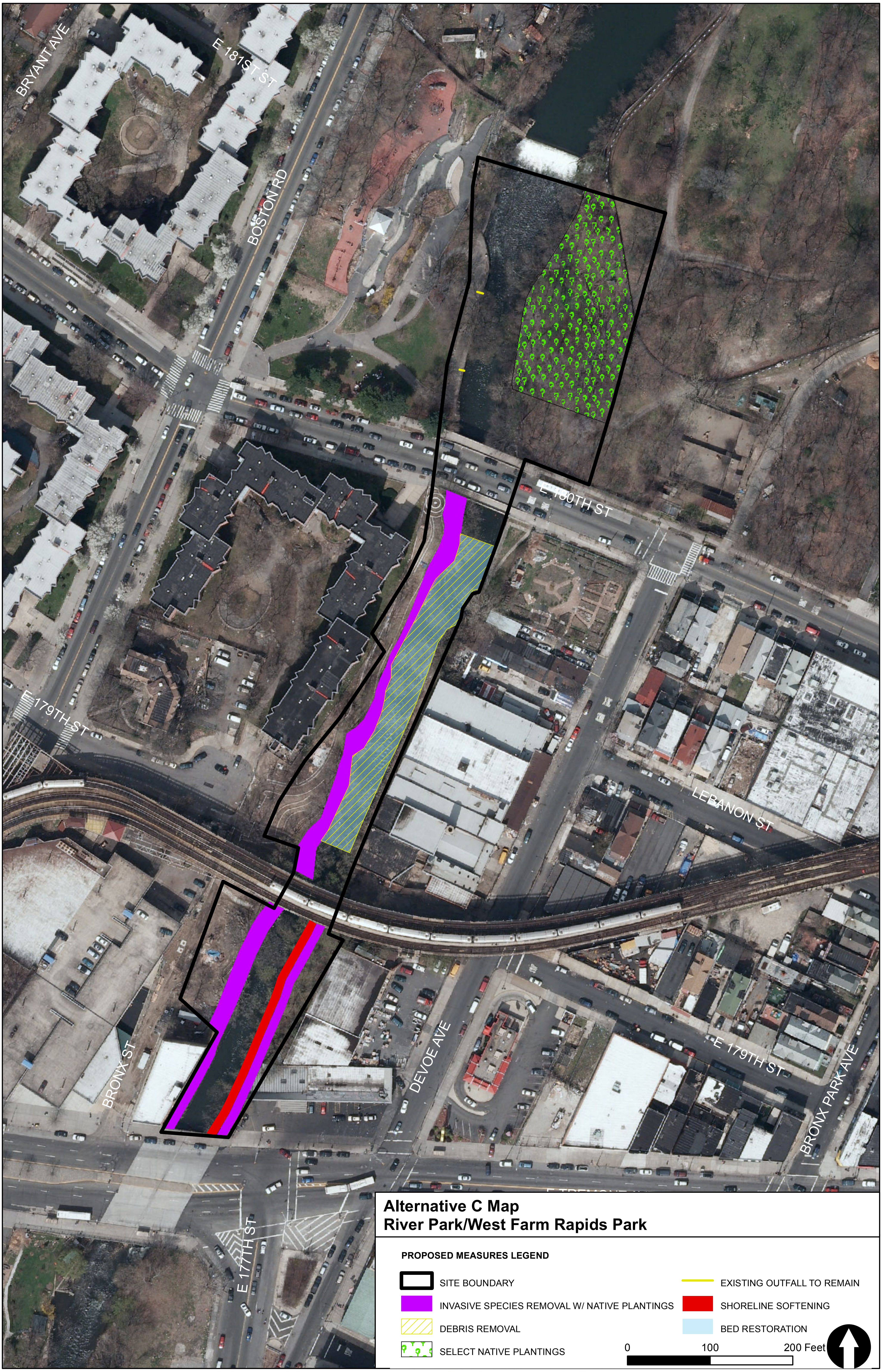
Site 860. Bronx River Park



Alternative A Map
River Park/West Farm Rapids Park



Alternative B Map
River Park/West Farm Rapids Park

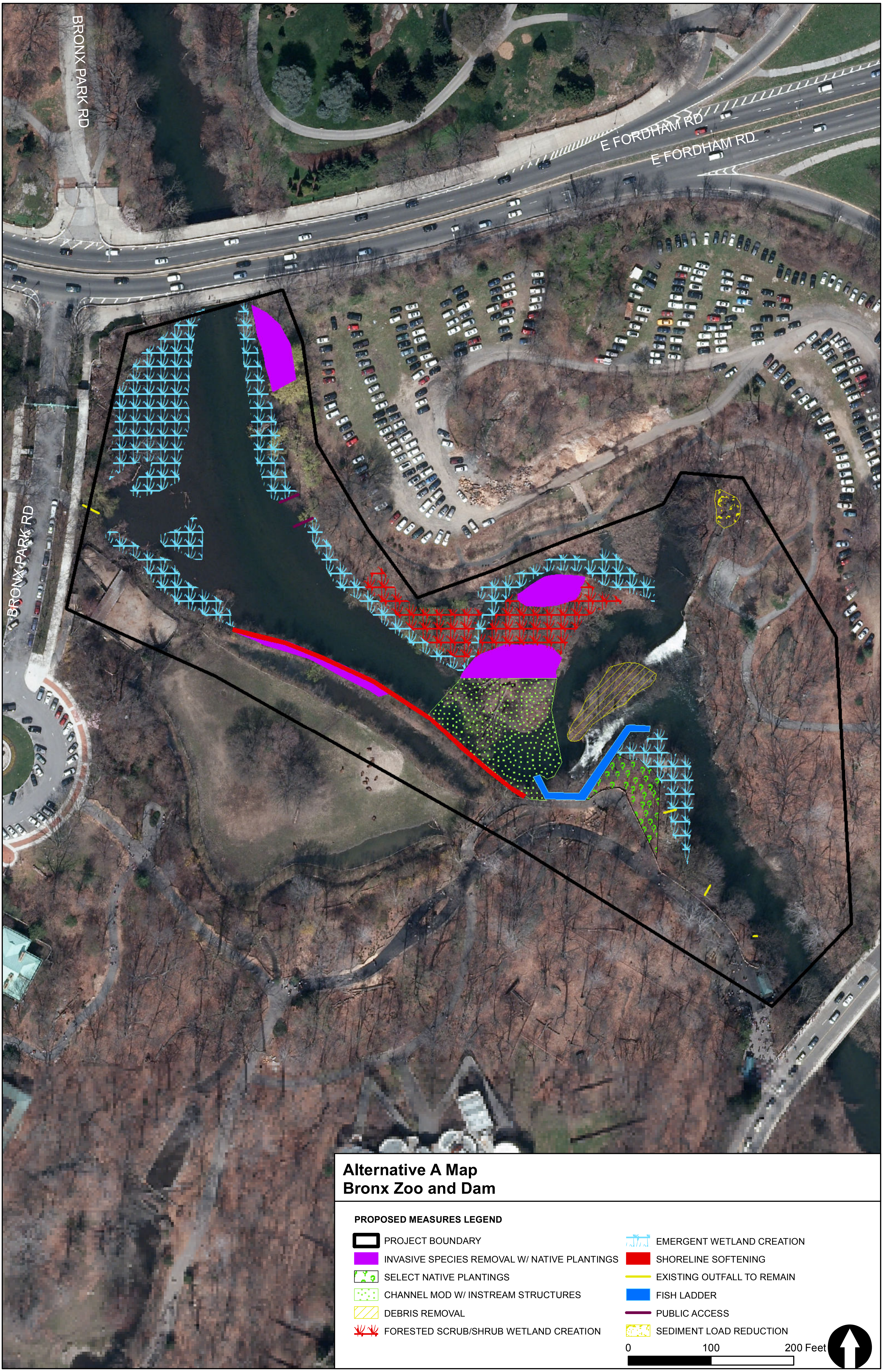


Alternative C Map
River Park/West Farm Rapids Park

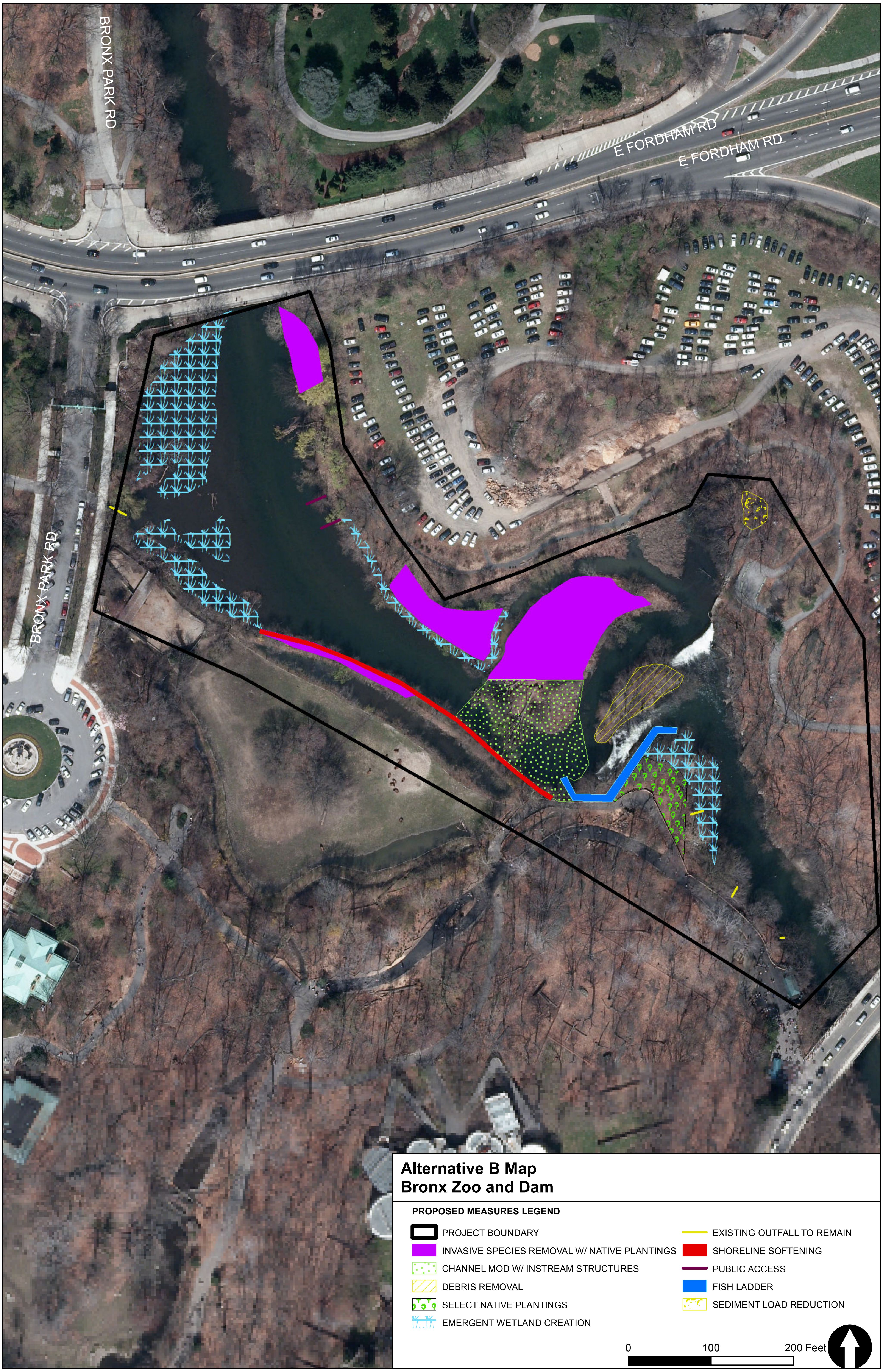
PROPOSED MEASURES LEGEND

☐	SITE BOUNDARY	—	EXISTING OUTFALL TO REMAIN
🟪	INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS	🟥	SHORELINE SOFTENING
▨	DEBRIS REMOVAL	🟦	BED RESTORATION
🟩	SELECT NATIVE PLANTINGS		

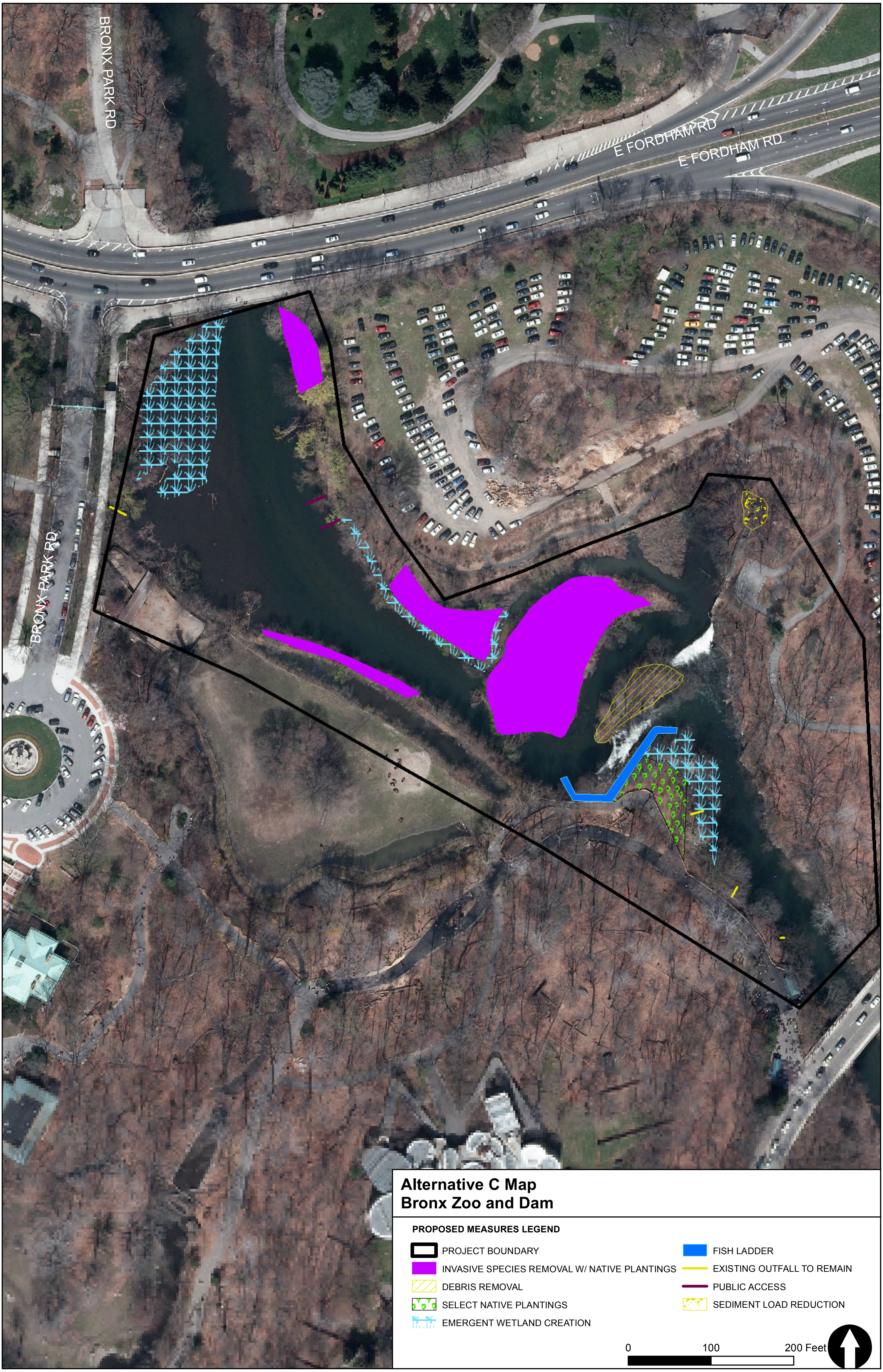
Site 861. Bronx Zoo and Dam



Alternative A Map
Bronx Zoo and Dam



Alternative B Map
Bronx Zoo and Dam



Alternative C Map
Bronx Zoo and Dam

Site 863. Stone Mill Dam

Alternative A Map
Stone Mill Dam

Alternative B Map
Stone Mill Dam

Alternative C Map
Stone Mill Dam

Site 113. Shoelace Park

Alternative A Map
Shoelace Park North

Alternative A Map
Shoelace Park South

Alternative B Map
Shoelace Park North

PROPOSED MEASURES LEGEND

- ▭ SITE BOUNDARY
- 🟪 INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS
- — PUBLIC ACCESS
- — EXISTING OUTFALL TO REMAIN
- 🟩 BANK STABILIZATION
- 🟥 SHORELINE SOFTENING
- ■ PROPOSED PATH
- ▨ SELECT NATIVE PLANTINGS
- ▨ CHANNEL MOD W/ INSTREAM STRUCTURES
- ▨ SEDIMENT LOAD REDUCTION
- ■ FUTURE WITHOUT PROJECT CONDITIONS WORK

Alternative B Map
Shoelace Park South

Alternative C Map
Shoelace Park North

Alternative C Map
Shoelace Park South

Site 862. Muskrat Cove

Alternative A Map
Muskrat Cove

PROPOSED MEASURES LEGEND

☐	SITE BOUNDARY	🟩	BANK STABILIZATION
🟪	INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS	🟥	SHORELINE SOFTENING
▨	20% INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS	▨	DEBRIS REMOVAL
▩	CHANNEL MOD W/ INSTREAM STRUCTURES	🟦	SEDIMENT BASIN
—	EXISTING OUTFALL TO REMAIN	■	SNAG REMOVAL

Alternative B Map
Muskrat Cove

Alternative C Map
Muskrat Cove

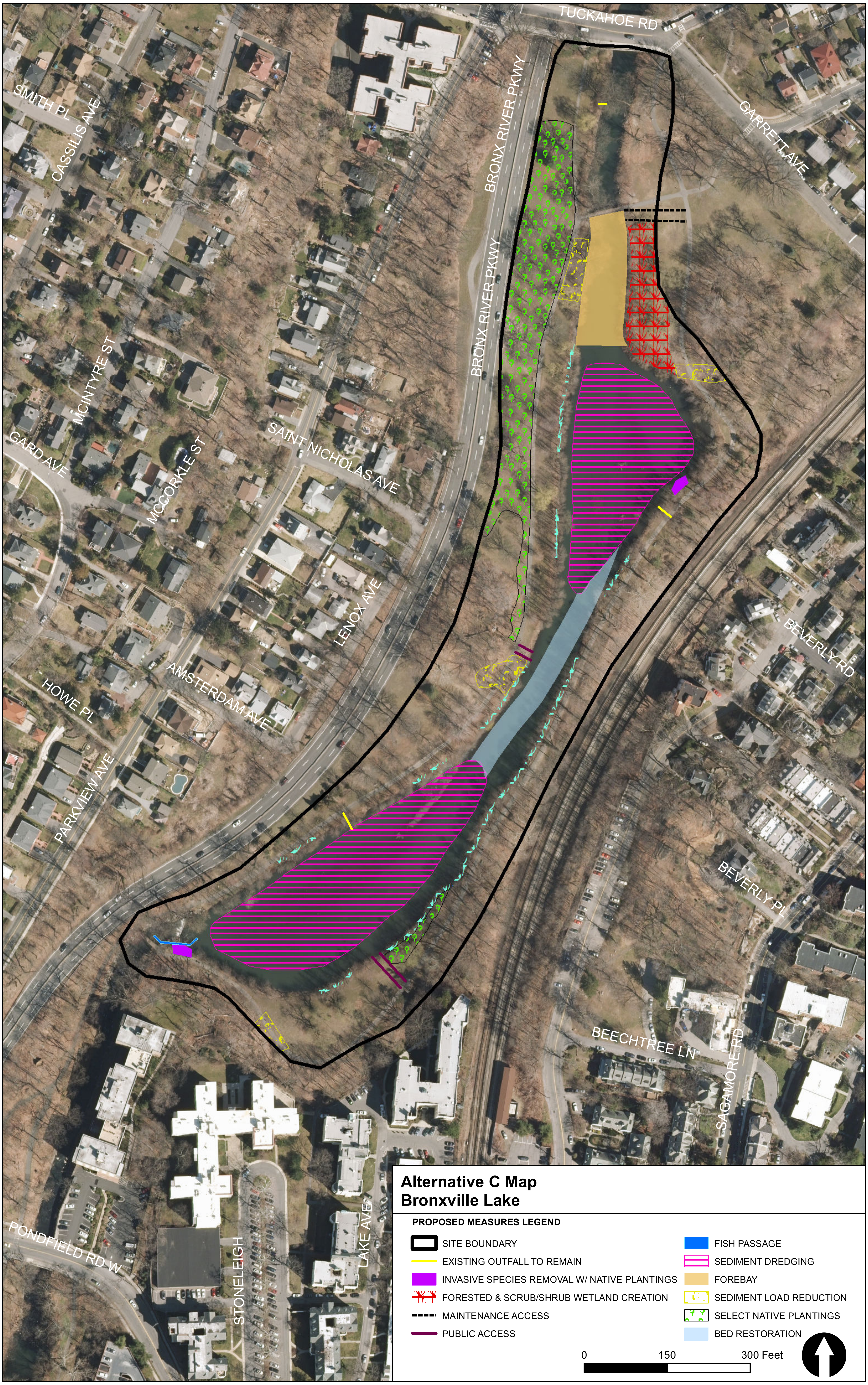
Site 851. Bronxville Lake

Alternative A Map
Bronxville Lake

Alternative B Map
Bronxville Lake

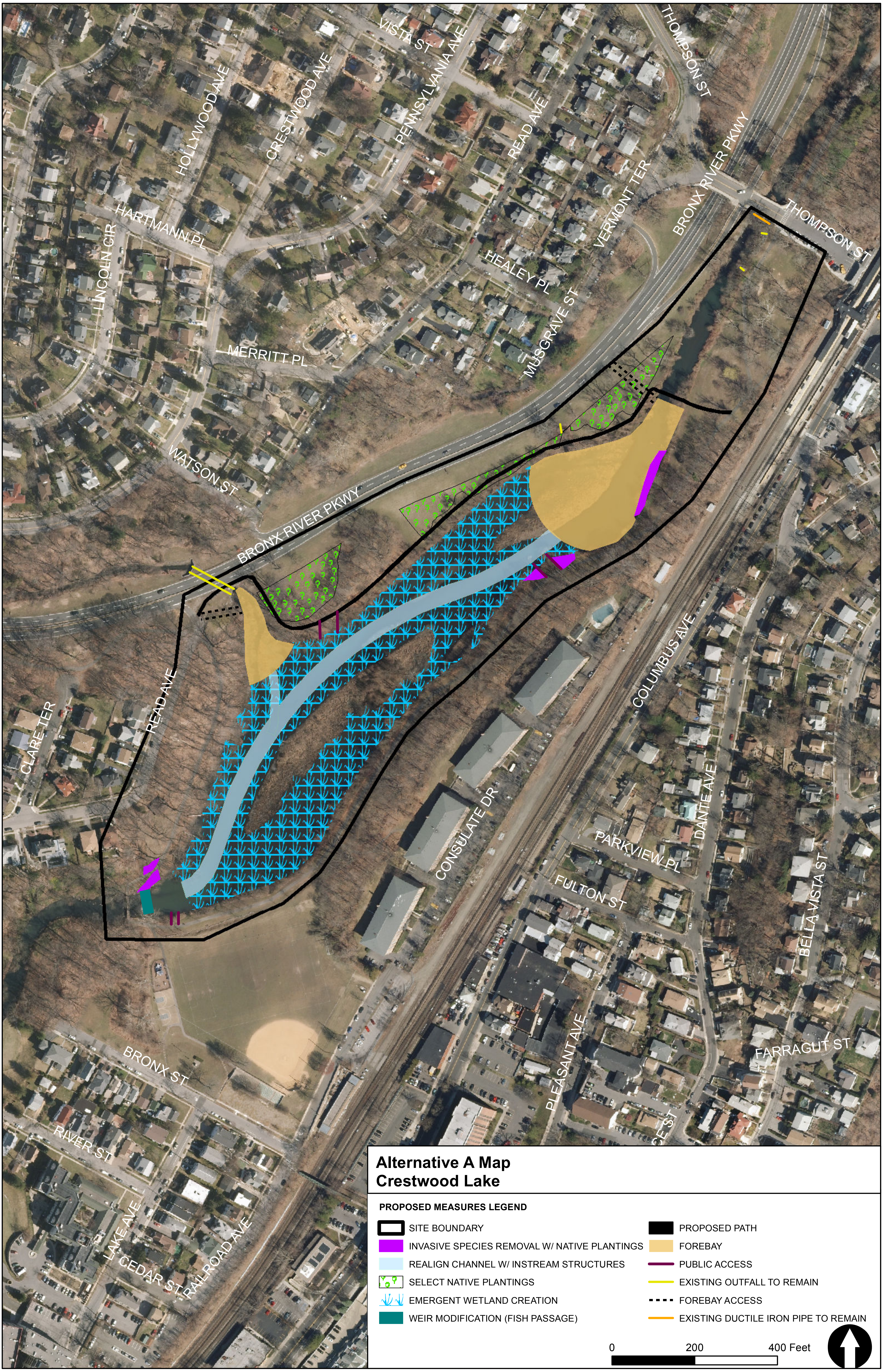
PROPOSED MEASURES LEGEND

- ▭ SITE BOUNDARY
- FORESTED & SCRUB/SHRUB WETLAND CREATION
- 🟪 INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS
- 🟦 WEIR MODIFICATION (FISH PASSAGE)
- - - - MAINTENANCE ACCESS
- ▨ SEDIMENT DREDGING
- 🟦 BED RESTORATION
- — EXISTING OUTFALL TO REMAIN
- — PUBLIC ACCESS
- 🟧 FOREBAY
- ▨ SEDIMENT LOAD REDUCTION
- ▨ SELECT NATIVE PLANTINGS



Alternative C Map
Bronxville Lake

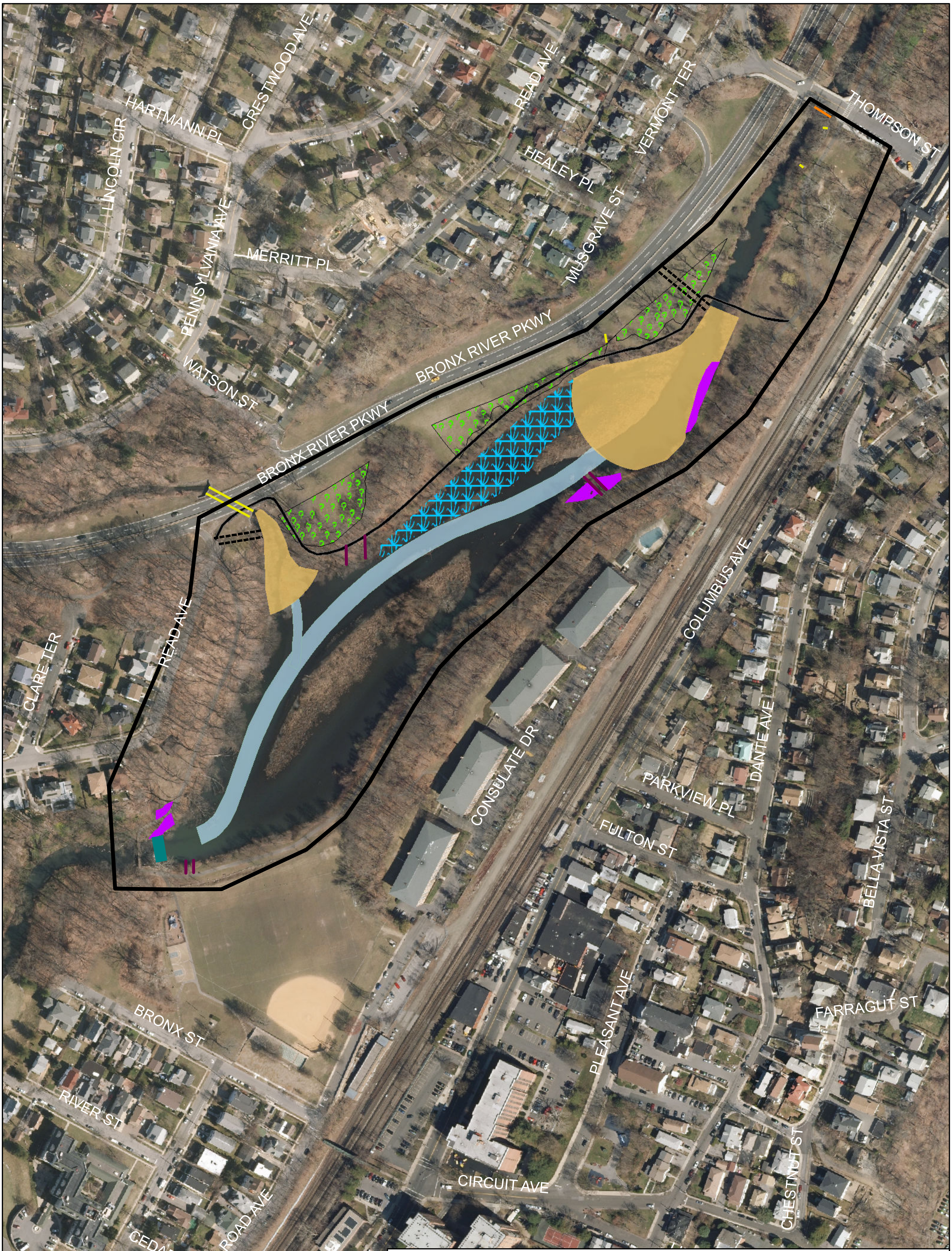
Site 852. Crestwood Lake



Alternative A Map
Crestwood Lake

PROPOSED MEASURES LEGEND

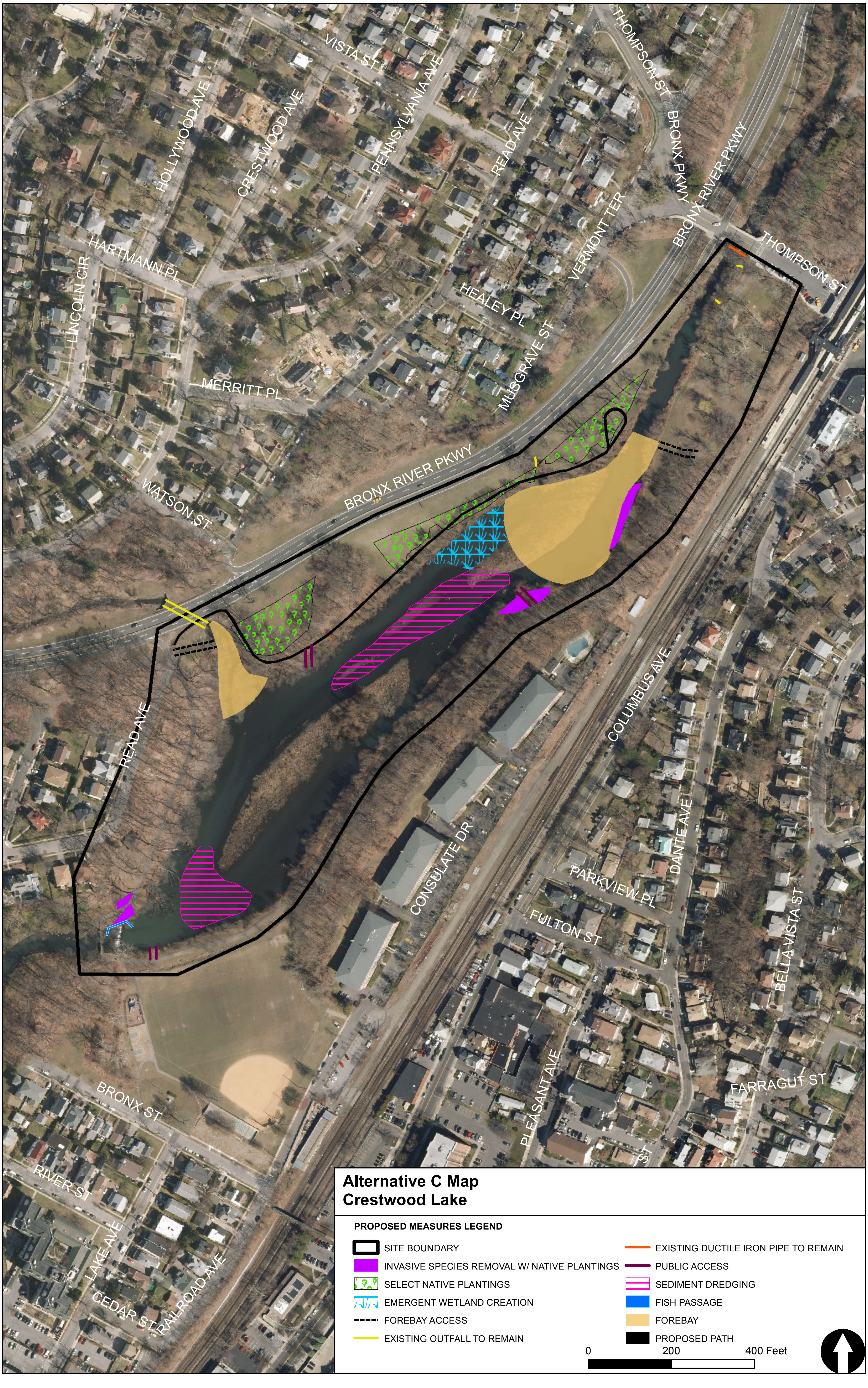
▭ SITE BOUNDARY	■ PROPOSED PATH
🟪 INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS	🟧 FOREBAY
▭ REALIGN CHANNEL W/ INSTREAM STRUCTURES	— PUBLIC ACCESS
🟩 SELECT NATIVE PLANTINGS	— EXISTING OUTFALL TO REMAIN
✳ EMERGENT WETLAND CREATION	- - - FOREBAY ACCESS
🟦 WEIR MODIFICATION (FISH PASSAGE)	— EXISTING DUCTILE IRON PIPE TO REMAIN



Alternative B Map
Crestwood Lake

PROPOSED MEASURES LEGEND

▭	SITE BOUNDARY	—	EXISTING OUTFALL TO REMAIN
■	INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS	—	EXISTING DUCTILE IRON PIPE TO REMAIN
▨	SELECTIVE NATIVE PLANTINGS	■	PROPOSED PATH
✳	EMERGENT WETLAND CREATION	■	FOREBAY
■	BED RESTORATION	—	PUBLIC ACCESS
■	WEIR MODIFICATION (FISH PASSAGE)	- - -	FOREBAY ACCESS



Alternative C Map
Crestwood Lake

Site 853. Garth Woods and Harney Road

Alternative A-2 Map
Garth Woods

Alternative A Map
Harney Road

PROPOSED MEASURES LEGEND

▭ SITE BOUNDARY

▬ CULVERT UNDER ROAD

▭ EMERGENT WETLANDS (CATTAILS)

▭ EMERGENT WETLANDS (WET MEADOW)

▬ INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS

▬ WEIR MODIFICATION (FISH PASSAGE)

― EXISTING OUTFALL TO REMAIN

▭ EMERGENT WETLAND CREATION

▭ SEDIMENT LOAD REDUCTION

▭ SELECTIVE NATIVE PLANTINGS

▬ SHORELINE SOFTENING

▭ CHANNEL MOD W/ INSTREAM STRUCTURES

Alternative B Map
Harney Road

Alternative C Map
Harney Road

Site 854. Westchester County Center

Alternative A Map
Westchester County Center

PROPOSED MEASURES LEGEND

- ▭ SITE BOUNDARY
- 🟪 INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS
- SELECT NATIVE PLANTINGS
- EMERGENT WETLAND CREATION
- REALIGN CHANNEL W/ INSTREAM STRUCTURES
- ■ PROPOSED PATH
- EXISTING DUCTILE IRON PIPE TO REMAIN (ASSUMED LOCATION)
- EXISTING OUTFALL TO REMAIN
- BED RESTORATION
- SEDIMENT BASIN
- 🟥 SHORELINE SOFTENING
- CHANNEL PLUG W/ NATIVE PLANTINGS
- FUTURE WITHOUT PROJECT CONDITIONS WORK
- ---- ACCESS

Alternative B Map
Westchester County Center

PROPOSED MEASURES LEGEND

▭	SITE BOUNDARY
▨	BED RESTORATION
- - -	ACCESS
—	EXISTING DUCTILE IRON PIPE TO REMAIN (ASSUMED LOCATION)
—	EXISTING OUTFALL TO REMAIN
▨	SEDIMENT BASIN
▨	CHANNEL PLUG W/ NATIVE PLANTINGS
✱	EMERGENT WETLAND CREATION
⁖	SELECT NATIVE PLANTINGS
▨	INVASIVE SPECIES REMOVAL W/ NATIVE PLANTINGS
▨	BANK STABILIZATION
⁖	CHANNEL MOD W/ INSTREAM STRUCTURE
▨	FUTURE WITHOUT PROJECT CONDITIONS WORK

Alternative C Map
Westchester County Center