HUDSON RIVER HABITAT RESTORATION

ECOSYSTEM RESTORATION
FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

Appendix D: Habitat Evaluation / Ecosystem Benefits

U.S. ARMY CORPS OF ENGINEERS
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Contents

List of Tables ii
List of Attachments: v
List of Figures: vi
1.0 Introduction 1
2.0 Evaluation of Planned Wetlands 1
2.1 Methodology 2
2.2 Field Sampling & Data Processing 5
2.3 Functional Capacity Unit Results for Alternatives 6
Binnen Kill North 7
Binnen Kill South 45
Charles Rider Park 66
Henry Hudson Park 73
Schodack Island North 84
Schodack Island South 97
Schodack Island Pocket Wetland A 108
Schodack Island Pocket Wetland B 115
Schodack Island Pocket Wetland C 121
Schodack Island Pocket Wetland D 128
2.4 Functional Capacity Unit Results for Recommended Plan 135
Henry Hudson Park 135
Schodack Island North 139
3.0 Watershed-Scale Upstream Connectivity Toolkit 146
4.0 References 155

List of Tables

Table 2-1: Ecological Functions addressed by EPW 2
Table 2-2: Binnen Kill North Results Summary 8
Table 2-3: Binnen Kill North Existing Conditions - TY-0 9
Table 2-4: Binnen Kill North Existing Conditions – TY-50 11
Table 2-5: Binnen Kill North Alternative 1 – TY-0 13

Table 2-6: Binnen Kill North Alternative 1 – TY-2 15
Table 2-7: Binnen Kill North Alternative 1 – TY-20 17
Table 2-8: Binnen Kill North Alternative 1 – TY-50 19
Table 2-9: Binnen Kill North Alternative 2 – TY-0 21
Table 2-10: Binnen Kill North Alternative 2 – TY-2 23
Table 2-11: Binnen Kill North Alternative 2 – TY-20 25
Table 2-12: Binnen Kill North Alternative 2 – TY-50 27
Table 2-13: Binnen Kill North Alternative 3 – TY-0 29
Table 2-14: Binnen Kill North Alternative 3 – TY-2 31
Table 2-15: Binnen Kill North Alternative 3 – TY-20 33
Table 2-16: Binnen Kill North Alternative 3 – TY-50 35
Table 2-17: Binnen Kill North Alternative 4 – TY-0 37
Table 2-18: Binnen Kill North Alternative 4 – TY-2 39
Table 2-19: Binnen Kill North Alternative 4 – TY-20 41
Table 2-20: Binnen Kill North Alternative 4 – TY-50 43
Table 2-21: Binnen Kill South Results Summary 46
Table 2-22: Binnen Kill South Existing Conditions - TY-0 47
Table 2-23: Binnen Kill South Existing Conditions – TY-50 49
Table 2-24: Binnen Kill South Alternative 1 – TY-0 51
Table 2-25: Binnen Kill South Alternative 1 – TY-2 53
Table 2-26: Binnen Kill South Alternative 1 – TY-20 55
Table 2-27: Binnen Kill South Alternative 1 – TY-50 57
Table 2-28: Binnen Kill South Alternative 2 – TY-0 59
Table 2-29: Binnen Kill South Alternative 2 – TY-2 61
Table 2-30: Binnen Kill South Alternative 2 – TY-20 63
Table 2-31: Binnen Kill South Alternative 2 – TY-50 64
Table 2-32: Charles Rider Park Results Summary 66
Table 2-33: Charles Rider Park Existing Conditions – TY-0 67
Table 2-34: Charles Rider Park Existing Conditions – TY-50 68
Table 2-35: Charles Rider Park Alternative 1 – TY-0 69
Table 2-36: Charles Rider Park Alternative 1 – TY-2 70
Table 2-37: Charles Rider Park Alternative 1 – TY-20 71
Table 2-38: Charles Rider Park Alternative 1 – TY-50 72
Table 2-39: Henry Hudson Park Results Summary 74
Table 2-40: Henry Hudson Park Existing Condition – TY-0 75
Table 2-41: Henry Hudson Park Existing Condition – TY-50 75
Table 2-42: Henry Hudson Park Alternative 1 – TY-0 76
Table 2-43: Henry Hudson Park Alternative 1 – TY-2 77
Table 2-44: Henry Hudson Park Alternative 1 – TY-20 78
Table 2-45: Henry Hudson Park Alternative 1 – TY-50 79

Table 2-46: Henry Hudson Park Alternative 2 – TY-0 80
Table 2-47: Henry Hudson Park Alternative 2 – TY-2 81
Table 2-48: Henry Hudson Park Alternative 2 – TY-20 82
Table 2-49: Henry Hudson Park Alternative 2 – TY-50 83
Table 2-50: Schodack Island North Results Summary 85
Table 2-51: Schodack Island North Existing Condition -TY-0 86
Table 2-52: Schodack Island North Existing Condition – TY-50 87
Table 2-53: Schodack Island North Alternative 1 – TY-0 88
Table 2-54: Schodack Island North Alternative 1 – TY-2 89
Table 2-55: Schodack Island North Alternative 1 – TY-20 91
Table 2-56: Schodack Island North Alternative 1 – TY-50 92
Table 2-57: Schodack Island North Alternative 2 – TY-0 93
Table 2-58: Schodack Island North Alternative 2 – TY-2 94
Table 2-59: Schodack Island North Alternative 2 – TY-20 95
Table 2-60: Schodack Island North Alternative 2 – TY-50 96
Table 2-61: Schodack Island South Results Summary 97
Table 2-62: Schodack Island South Existing Condition – TY-0 98
Table 2-63: Schodack Island South Existing Condition – TY-50 99
Table 2-64: Schodack Island South Alternative 1 – TY-0 100
Table 2-65: Schodack Island South Alternative 1 – TY-2 101
Table 2-66: Schodack Island South Alternative 1 – TY-20 102
Table 2-67: Schodack Island South Alternative 1 – TY-50 103
Table 2-68: Schodack Island South Alternative 2 – TY-0 104
Table 2-69: Schodack Island South Alternative 2 – TY-2 105
Table 2-70: Schodack Island South Alternative 2 – TY-20 106
Table 2-71: Schodack Island South Alternative 2 – TY-50 107
Table 2-72: Schodack Island Pocket Wetland A Results Summary 108
Table 2-73: Schodack Island Pocket Wetland A Existing Condition – TY-0 109
Table 2-74: Schodack Island Pocket Wetland A Existing Condition – TY-50 110
Table 2-75: Schodack Island Pocket Wetland A Alternative 1 – TY-0 110
Table 2-76: Schodack Island Pocket Wetland A Alternative 1 – TY-2 112
Table 2-77: Schodack Island Pocket Wetland A Alternative 1 – TY-20 113
Table 2-78: Schodack Island Pocket Wetland A Alternative 1 – TY-50 114
Table 2-79: Schodack Island Pocket Wetland B Results Summary 115
Table 2-80: Schodack Island Pocket Wetland B Existing Condition – TY-0 116
Table 2-81: Schodack Island Pocket Wetland B Existing Condition – TY-50 116
Table 2-82: Schodack Island Pocket Wetland B Alternative 1 – TY-0 117
Table 2-83: Schodack Island Pocket Wetland B Alternative 1 – TY-2 118
Table 2-84: Schodack Island Pocket Wetland B Alternative 1 – TY-20 119
Table 2-85: Schodack Island Pocket Wetland B Alternative 1 – TY-50 120

Table 2-86: Schodack Island Pocket Wetland C Results Summary 121
Table 2-87: Schodack Island Pocket Wetland C Existing Condition – TY-0 122
Table 2-88: Schodack Island Pocket Wetland C Existing Condition – TY-50 123
Table 2-89: Schodack Island Pocket Wetland C Alternative 1 – TY-0 123
Table 2-90: Schodack Island Pocket Wetland C Alternative 1 – TY-2 124
Table 2-91: Schodack Island Pocket Wetland C Alternative 1 – TY-20 126
Table 2-92: Schodack Island Pocket Wetland C Alternative 1 – TY-50 127
Table 2-93: Schodack Island Pocket Wetland D Results Summary 128
Table 2-94: Schodack Island Pocket Wetland D Existing Condition – TY-0 129
Table 2-95: Schodack Island Pocket Wetland D Existing Condition – TY-50 130
Table 2-96: Schodack Island Pocket Wetland D Alternative 1 – TY-0 131
Table 2-97: Schodack Island Pocket Wetland D Alternative 1 – TY-2 132
Table 2-98: Schodack Island Pocket Wetland D Alternative 1 – TY-20 133
Table 2-99: Schodack Island Pocket Wetland D Alternative 1 – TY-50 134
Table 2-100: Henry Hudson Park Existing Condition – TY-0 136
Table 2-101: Henry Hudson Park Existing Condition – TY-50 136
Table 2-102: Henry Hudson Park Recommended Plan – TY-0 137
Table 2-103: Henry Hudson Park Recommended Plan – TY-2 137
Table 2-104: Henry Hudson Park Recommended Plan – TY-20 138
Table 2-105: Henry Hudson Park Recommended Plan – TY-50 138
Table 2-106: Schodack Island North Existing Condition – TY-0 140
Table 2-107: Schodack Island North Existing Condition – TY-50 141
Table 2-108: Schodack Island North Recommended Plan – TY-0 142
Table 2-109: Schodack Island North Recommended Plan – TY-2 143
Table 2-110: Schodack Island North Recommended Plan – TY-20 144
Table 2-111: Schodack Island North Recommended Plan – TY-50 145
Table 3-1. Aquatic Organism Passage Background information 148
Table 3-2. Input data for WUCT application in the HRHR Study 149
Table 3-3. Alternatives analysis using the WUCT in the HRHR Study 150

List of Attachments:

Attachment A: EPW Photograph Log

Attachment B: EPW Functional Capacity Index (FCI) Summary Tables

Attachment C: EPW Figures for Baseline, Tentatively Selected Plan, and Recommended Plan

List of Figures:

Binnen Kill North: Baseline Conditions 2018 EPW Map

Binnen Kill North: Baseline Conditions 2075 EPW Map

Binnen Kill North: Tentatively Selected Plan EPW Map

Binnen Kill North: Recommended Plan EPW Map

Binnen Kill South: Baseline Conditions 2018 EPW Map

Binnen Kill South: Baseline Conditions 2075 EPW Map

Binnen Kill South: Tentatively Selected Plan EPW Map

Schodack Island North: Baseline Conditions 2018 EPW Map

Schodack Island North: Baseline Conditions 2075 EPW Map

Schodack Island North: Tentatively Selected Plan EPW Map

Schodack Island South: Baseline Conditions 2018 EPW Map

Schodack Island South: Baseline Conditions 2075 EPW Map

Schodack Island Pocket Wetlands: Baseline Conditions 2018 EPW Map

Schodack Island Pocket Wetlands: Baseline Conditions 2075 EPW Map

Charles Rider Park: Baseline Conditions 2018 EPW Map

Charles Rider Park: Baseline Conditions 2075 EPW Map

Henry Hudson Park: Baseline Conditions 2018 EPW Map

Henry Hudson Park: Baseline Conditions 2075 EPW Map

Henry Hudson Park: Tentatively Selected Plan EPW Map

Henry Hudson Park: Recommended Plan EPW Map

1.0 Introduction

This Habitat Evaluation and Ecosystem Benefit appendix provides the detailed methods and results of the environmental benefits for proposed restoration actions evaluated in the Hudson River Habitat Restoration Feasibility Study. The purpose of the habitat benefit evaluation is to evaluate and quantify, to the extent possible, environmental benefits of alternative plans for habitat improvements within the study area. A total of 23 alternatives were developed at six sites as outlined in the Plan Formulation Appendix C. To calculate the non-monetary benefits of the restoration alternatives, two certified models were used: Evaluation of Planned Wetlands (EPW) and Watershed-Scale Upstream Connectivity Toolkit (WUCT) depending on habitat restoration type:

- EPW was used for Large Mosaic (Binnen Kill and Schodack Island) and Shoreline Restoration sites (Charles Rider and Henry Hudson Park); and
- WUCT was used for Tributary Connectivity sites including Aquatic Organism Passage (AOP) barriers on Rondout and Moodna Creeks.

These benefits were computed based on temporal trajectories and compared to the future-without project condition to determine the ecological lift of the restoration alternative. Ecological improvement, or lift, is presented as average annual functional capacity units (AAFCUs) for EPW or habitat units (AAHUs) for WUCT and serve as inputs to Cost Effectiveness and Incremental Cost Analysis (CEICA) to compare the cost effectiveness of alternatives at a site (Appendix F). The calculation of AAFCUs are also included in Appendix F.

2.0 Evaluation of Planned Wetlands

This assessment of wetland functions and values presents the means, methods, data, discussion and conclusions developed to document the existing ecological value of four project sites in the study area: Binnen Kill, Schodack Island, Henry Hudson Park, and Charles Rider Park. It also presents a forecast of ecosystem functions that can be expected at the sites upon completion if the proposed ecosystem restoration activities are completed and the areas return to a more natural state.

EPW is a rapid assessment procedure, certified for regional use in July 2016, which provides a method for determining the capacity of a wetland to perform certain ecological and watershed functions by evaluating elements of major wetland functions. EPW evaluates functional categories including shoreline bank erosion, sediment stabilization, water quality, wildlife, and fish (Bartoldus 1994, Bartoldus et al., 1994). EPW scores were calculated for each component/site alternative. Functions of the existing wetlands and

uplands slated for restoration were characterized to assess the current functional capacity, establishing a baseline to determine the anticipated increase in functional capacity as a result of implementing the project as proposed.

The goal of this functional assessment was to assess the existing conditions of the onsite wetland ecosystems, and to project the state of the sites after restoration activities are completed. This will be used to prioritize the projected functional uplift provided by various restoration alternatives at these four project areas, and to forecast future functions at each site. This report presents the results of the EPW assessment of existing functional capacity at these project areas. Section 2.1 of this report outlines the means and methods employed. Section 2.2 presents the results of field assessments and discussion. In addition, Attachments provide: photo documentation of the wetland assessment areas (Attachment A), EPW scoring data forms and Functional Capacity Index (FCI) calculation worksheets and FCI & Functional Capacity Unit (FCU) summary tables (Attachment B), and figures illustrating the EPW results for baseline (2018), future without project (FWOP) conditions (2075) and projected wetland habitats represented to determine the Recommended Plan (Attachment C).

2.1 Methodology

The EPW assessment method was used to characterize the functional capacity of existing and reference freshwater tidal and nontidal wetlands on or within the vicinity of the proposed project limits. Functions of the existing wetlands and uplands slated for restoration/enhancement were characterized to assess current functional capacity, thereby establishing a baseline to determine the anticipated increase in functional capacity as a result of implementing the project as proposed.

EPW provides a method for determining the capacity of a wetland to perform certain ecological and watershed functions by evaluating elements of eight major wetland functions. These functions are found in Table 2-1.

Table 2-1: Ecological Functions addressed by EPW

Function	Abbreviation	Definition
Shoreline Bank Erosion Control	SB	Capacity to provide erosion control and to dissipate erosive forces at the shoreline bank.
Sediment stabilization	SS	Capacity to stabilize and retain previously deposited sediments.
Water quality	WQ	Capacity to retain and process dissolved or particulate materials to the benefit of downstream surface water quality.
Wildlife	WL	Degree to which a wetland functions as habitat for wildlife as described by habitat complexity.
Fish – Tidal	FT	Degree to which a wetland habitat meets the food/cover, reproductive, and water quality requirements of fish
Fish Non-Tidal Streams and Rivers	FS	Degree to which a wetland habitat meets the food/cover, reproductive, and water quality requirements of fish
Fish Non-Tidal Ponds and Lakes	FP	Degree to which a wetland habitat meets the food/cover, reproductive, and water quality requirements of fish
Uniqueness/Heritage	UH	Presence of characteristics that distinguish a wetland as unique, rare, or valuable

The project areas are predominately tidal and contain few nontidal wetland areas. The nontidal systems are not associated with freshwater streams, rivers, ponds or lakes, therefore, the FS and FP functions were not applicable and not assessed.

Within each function, numerous elements (i.e., physical, chemical, biological) are evaluated in order to characterize a wetland's capacity to perform that function. The elements assessed for each function are listed on the data forms completed during this assessment and are available upon request. An element score is a unit-less number ranging in value from 0.0 to 1.0 (where 1.0 represents the optimal score) that is assigned to each element based on a visual assessment of targeted characteristics within a wetland assessment area (WAA) as outlined in the EPW manual (Bartoldus et al. 1994). Element scores are combined based on equations contained within the EPW calculation worksheet to produce a Functional Capacity Index (FCI) value from 0.0 to 1.0, which provides a relative index of a WAA's capacity to perform a given function. Size (i.e.,

acreage) of the WAA is then multiplied by the FCI value to produce a wetland Functional Capacity Unit (FCU), which represents the WAA's capacity to perform each wetland function (Bartoldus et al. 1994) and accounts for wetland size. In this methodology a FCU is not calculated for the uniqueness/heritage (UH) function, as the size of the area is not considered to affect the value of this function. FCUs are used as the quantitative basis for wetland comparisons using the annualized average FCU discussed below.

The data analysis is presented in terms of FCUs and FCIs, as described above, which was used to document current site conditions and to forecast site conditions into the future.

To determine the TSP, Existing Site Conditions were analyzed for the following years:

- TY 0 (2025) presents current baseline conditions prior to any restoration actions.
- TY 50 (2075) is the estimated projection of current site conditions assuming no restoration actions are completed on the sites. Includes estimation of predicted sea level change (decrease in vegetated wetland, increase in open water, and change in wetland community type) as well as invasive species colonization/expansion.

Proposed Project Alternative Site Conditions were analyzed for the following years:

- TY 0 (2025) presents current baseline conditions prior to any restoration actions.
- TY 2 (2027) presents proposed site conditions one full growing season after implementation of restoration actions on the sites. The restoration design accounts for predicted sea levels for 2027.
- TY 20 (2045) presents proposed site conditions 19 full growing seasons after implementation of restoration actions on the sites.
- TY 50 (2075) presents proposed site conditions 49 full growing seasons after implementation of restoration actions on the sites. Includes estimation of predicted sea level change (decrease in vegetated wetland, increase in open water, and change in wetland community type).

The Recommended Plan alternatives were reevaluated following optimization. The projected construction schedule and durations modified the exact year that would be associated with TY 0, TY 2, TY 20 and TY 50 and the number of growing seasons that are affiliated with each year (e.g., TY 20 for Schodack Island Park represents 18 full growing seasons due to the longer construction schedule).

2.2 Field Sampling & Data Processing

Field personnel experienced in wetland/aquatic ecology, and wetland functional assessments conducted the field data collection and analysis in June 2018. Unless otherwise noted, the field assessment methodology followed the EPW manual (Bartoldus et al. 1994). Presently there are no other projects planned at these project areas, so the value presented as the existing condition is also applicable as a Future Without Project Condition.

Prior to field sampling, WAA's were identified within each project site. The project areas consisted of reference wetlands (adjacent natural/undisturbed wetland areas within the vicinity of the project sites) and the areas targeted for wetland restoration (disturbed and impaired wetlands). The entire Northeastern US is highly urbanized and impacted, so it is unlikely that the reference wetlands chosen for these studies are truly natural and undisturbed. However, every effort was made to choose the most unimpaired areas for comparisons, without sampling reference wetlands for historic fill and other hidden evidence of past disturbances. A WAA is defined as the wetland complex that a planned wetland will be compared to (e.g., a reference wetland or existing wetland to be restored) and includes wetlands of a similar hydro-geomorphic type (Bartoldus et al. 1994). WAA's for both reference and existing wetlands to be restored are described below.

Reference WAA's were selected within nearby wetlands located within close proximity to the wetlands proposed for restoration. These areas were used as a reference to help inform the selection of preferred alternatives within the wetlands proposed for restoration. The reference WAA's were comprised of highly functioning forested and scrub/shrub tidal wetlands. The reference sites were selected due to their similar landscape position and geomorphology and targeted vegetative composition when compared to the existing conditions of the wetlands proposed for restoration.

There were instances where data points were taken at nearby locations instead of on the site directly. For instance, the tidal open water data collected at Binnen Kill was also utilized to analyze the Charles Rider site. This approach was utilized when it was reasonable to assume that the parameters measured were similar between two sites, or site access was limited at a target area, or both. Notes are included on the tables in the following pages in cases where this approach was utilized. Each assessment element was visually evaluated following the means and methods outlined in the EPW manual (Bartoldus et al., 1994). Assessments were based on the observed conditions across each selected reference or restoration site. The field assessment involved recording a value from 0.0 to 1.0 or assigning N/A (not applicable) to each element based on an assessment of characteristics that did or did not occur within each specific wetland community employing the scoring guidance provided by Bartoldus et al. (1994).

Element values for the applicable functions in each WAA and reference site were recorded in the field on an EPW Element Spreadsheet (available upon request). FCI

calculations were then performed using the equations presented in the EPW manual (Bartoldus et al. 1994). FCU values were calculated for comparative purposes and were based on the total acreage of the existing wetlands (WAA) to be restored. Acreage for existing wetland types was determined using habitat mapping from previous efforts; spatial data from the New York State Department of Environmental Conservation (NYSDEC) was used for Schodack Island and spatial data from the Natural Resource Inventory and Assessment of the Binnen Kill (2017). The total acreage is coincident with the proposed restoration areas (planned wetlands), representing the total gain of wetland function and value by restoration type. As stated previously, FCUs are used as the quantitative basis for wetland comparisons using the annualized average FCU discussed below.

Calculation of wetland community acreages for TY 50 analyzed various environmental factors. Firstly, an estimation of predicted sea level change was completed based on the USACE Sea-Level Change Curve Calculator (See Engineering Appendix B). Specifically, changes in elevation to the Mean Tide Line (MTL) and the Mean Higher High Water line (MHHW or Spring High Tide) were evaluated. Using surveyed cross sections and available topographic data derived from LiDAR (Light Detection And Ranging), the predicted MTL and MHHW elevations were plotted and the extent of wetland communities were remapped. In the case where no restoration was proposed (Future Without Project), predictions of invasive species colony expansion into additional wetland areas onsite were made. These predictions were based on direct project experience with these types of systems.

2.3 Functional Capacity Unit Results for Alternatives

The following sections demonstrate that by comparing the FCUs between the existing wetlands (WAA) and the reference (planned wetland) conditions, the projected functional uplift from the proposed restoration activities is clear. The numerical differential is supported by the understanding that invasive-dominated wetlands offer impaired functionality and upland communities offer zero wetland functionality when compared to healthy and diverse wetland systems.

The project area was divided into ten separate sites based upon habitat similarities. The following sections summarize the acreages, FCIs and FCUs of the existing wetlands (WAA) in 2025 as well as the projected site conditions 50 years (2075) from 2025, which is compared to the reference (Planned Wetland) conditions to project functional uplift numerically. The EPW output presented in the summary tables and the work sheets (available upon request) quantify the potential ecosystem benefits of each proposed restoration alternative by comparing the FCI and FCU values between the baseline conditions for each WAA.

Binnen Kill North

Binnen Kill North comprises approximately 105.71 acres. Four restoration alternatives were evaluated for this site component. The existing (Table 2-3) total FCU for this site after 50 years is 222.94 (Table 2-4). Tables 2-5 through 2-17 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for each of the four alternatives.

Alternative 1 proposes the following:

- restore 89.94 acres of wetlands by treating invasive vegetation and planting native species; and
- enhance 0.27 acres by replacing an existing metal pipe with a larger box culvert and adding floodplain culverts to increase flow conveyance.

This Alternative yields a total FCU after 50 years of 241.03 (Table 2.8).

Alternative 2 proposes the following:

- restore 43.77 acres of wetlands by treating invasive vegetation and planting native species;
- restore 15.52 acres of forested wetlands by grading to achieve wetland hydrology and planting native species;
- restore 4.29 acres of emergent wetlands by treating invasive vegetation, grading to achieve wetland hydrology, and planting native vegetation;
- restore 41.88 acres of emergent wetlands by creating a channel bisecting the area, treating invasive vegetation, grading the channel and diffuse pools, and planting native vegetation; and
- enhancing 0.27 acres by removing an existing culvert and earthen berm, grading the channel and fringe wetlands, and planting native vegetation.

This Alternative yields a total FCU after 50 years of 287.69 (Tables 2-12).

Alternative 3 is similar to Alternative 1 but eliminates the enhancement of the existing metal pipe culvert.

- restore 89.94 acres of wetlands by treating invasive vegetation and planting native species; and

This Alternative yields a total FCU after 50 years of 241.07.

Alternative 4 is similar to Alternative 2 but eliminates the removal of the existing metal pipe culvert.

- restore 43.77 acres of wetlands by treating invasive vegetation and planting native species;
- restore 15.52 acres of forested wetlands by grading to achieve wetland hydrology and planting native species;
- restore 4.29 acres of emergent wetlands by treating invasive vegetation, grading to achieve wetland hydrology, and planting native vegetation; and
- restore 41.88 acres of emergent wetlands by creating a channel bisecting the area, treating invasive vegetation, grading the channel and diffuse pools, and planting native vegetation.

This Alternative yields a total FCU after 50 years of 287.63 (Table 2-20).

Table 2-2: Binnen Kill North Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	222.94	--	--	222.94
Alternative 1*	222.94	230.24	241.03	241.03
Alternative 2	222.94	277.69	289.90	287.69
Alternative 3*	222.94	230.30	241.08	241.07
Alternative 4	222.94	277.63	289.84	287.63

*includes restored shallow emergent wetlands

Table 2-3: Binnen Kill North Existing Conditions - TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	42.18	*NA*	*0.00*	0.8	33.74	0.8	33.74	0.7	29.53	*NA*	*0.00*	1.0	*NA*	97.01
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Phalaris arundinacea Wetland	RC-1	14.14	*NA*	*0.00*	0.8	11.31	1.0	14.14	0.7	9.90	*NA*	*0.00*	1.0	*NA*	35.35
Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	*NA*	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.21	0.6	0.13	1.0	0.21	0.7	0.15	0.6	0.13	0.3	0.06	1.0	*NA*	0.67
Upper Tidal Wetland	IM-1	0.08	0.5	0.04	0.7	0.06	0.6	0.05	0.7	0.06	0.4	0.03	1.0	*NA*	0.23
Wet Meadow	WM-1	0.05	*NA*	*NA*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*NA*	1.0	*NA*	0.12

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	0.45	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals	**105.71**													**222.94**

Table 2-4: Binnen Kill North Existing Conditions – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	42.18	*NA*	*0.00*	0.8	33.74	0.8	33.74	0.7	29.53	*NA*	*0.00*	1.0	*NA*	97.01
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Phalaris arundinacea Wetland	RC-1	14.14	*NA*	*0.00*	0.8	11.31	1.0	14.14	0.7	9.90	*NA*	*0.00*	1.0	*NA*	35.35
Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	*NA*	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.21	0.6	0.13	1.0	0.21	0.7	0.15	0.6	0.13	0.3	0.06	1.0	*NA*	0.67
Upper Tidal Wetland	IM-1	0.08	0.5	0.04	0.7	0.06	0.6	0.05	0.7	0.06	0.4	0.03	1.0	*NA*	0.23
Wet Meadow	WM-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*0.00*	1.0	*NA*	0.12

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	0.45	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**222.94**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-5: Binnen Kill North Alternative 1 – TY-0
Existing Conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	42.18	*NA*	*0.0*	0.8	33.74	0.8	33.74	0.7	29.53	*NA*	*NA*	1.0	*NA*	97.01
Hardwood Swamp	FO-1	8.06	*NA*	*0.0*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*NA*	1.0	*NA*	20.96
Phalaris arundinacea Wetland	RC-1	14.14	*NA*	*0.0*	0.8	11.31	1.0	14.14	0.7	9.90	*NA*	*NA*	1.0	*NA*	35.35
Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.0*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*NA*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.0*	0.9	0.32	1.0	0.36	0.8	0.29	NA	NA	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.21	0.6	0.13	1.0	0.21	0.7	0.15	0.6	0.13	0.3	0.06	1.0	*NA*	0.67
Upper Tidal Wetland	IM-1	0.08	0.5	0.04	0.7	0.06	0.6	0.05	0.7	0.06	0.4	0.03	1.0	*NA*	0.23

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Wet Meadow	WM-1	0.05	*NA*	*NA*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*NA*	1.0	*NA*	0.12
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	0.45	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**222.94**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-6: Binnen Kill North Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels; compares existing to newly restored shallow emergent wetlands

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Existing Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
New Shallow Emergent Wetland	S-EM-2/S-EM-2	53.76	*NA*	*0.00*	0.9	48.38	0.9	48.38	0.8	43.01	*NA*	*0.00*	1.0	*NA*	139.78
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Upper Tidal Wetland	*IM-1 (TY-2)	0.28	0.5	0.14	0.6	0.17	0.6	0.17	0.7	0.20	0.4	0.11	1.0	*NA*	0.78
Wet Meadow	WM-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*0.00*	1.0	*NA*	0.12

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	3.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**230.24**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-7: Binnen Kill North Alternative 1 – TY-20
2045; post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Shallow Emergent Wetland	S-EM-2/S-EM-2	77.86	*NA*	*0.00*	1.0	77.86	1.0	77.86	0.8	62.29	*NA*	*0.00*	1.0	*NA*	218.01
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Upper Tidal Wetland	IM-1	0.28	0.5	0.14	0.7	0.20	0.6	0.17	0.7	0.20	0.4	0.11	1.0	*NA*	0.81
Wet Meadow	*FWW-SS	0.05	*NA*	*0.00*	0.9	0.05	1.0	0.05	0.8	0.04	NA	*0.00*	1.0	*NA*	0.14
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	3.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**241.03**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-8: Binnen Kill North Alternative 1 – TY-50
2075; post construction; approximately 50 years of growth; incorporates sea level change although sea level change will not impact this component

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Shallow Emergent Wetland	S-EM-2/S-EM-2	77.86	*NA*	*0.00*	1.0	77.86	1.0	77.86	0.8	62.29	*NA*	*0.00*	1.0	*NA*	218.01
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Upper Tidal Wetland	IM-1	0.28	0.5	0.14	0.7	0.20	0.6	0.17	0.7	0.20	0.4	0.11	1.0	*NA*	0.81
Wet Meadow	FO-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.8	0.04	*NA*	*0.00*	1.0	*NA*	0.13
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	3.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**241.03**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-9: Binnen Kill North Alternative 2 – TY-0
Existing conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	42.18	*NA*	*0.00*	0.8	33.74	0.8	33.74	0.7	29.53	*NA*	*0.00*	1.0	*NA*	97.01
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Phalaris arundinacea Wetland	RC-1	14.14	*NA*	*0.00*	0.8	11.31	1.0	14.14	0.7	9.90	*NA*	*0.00*	1.0	*NA*	35.35
Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.21	0.6	0.13	1.0	0.21	0.7	0.15	0.6	0.13	0.3	0.06	1.0	*NA*	0.67
Upper Tidal Wetland	IM-1	0.08	0.5	0.04	0.7	0.06	0.6	0.05	0.7	0.06	0.4	0.03	1.0	*NA*	0.23

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Wet Meadow	WM-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*0.00*	1.0	*NA*	0.12
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	0.45	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**222.94**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-10: Binnen Kill North Alternative 2 – TY-2
2027; post construction; one growing season; incorporates 2027 sea levels; compares existing to newly restored hardwood swamps and shallow emergent wetlands

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
New Hardwood Swamp	*FWW-SS (TY-2)	22.02	*NA*	*0.00*	0.9	19.82	0.9	19.82	0.8	17.62	NA	*0.00*	1.0	*NA*	57.25
Existing Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
New Shallow Emergent Wetland	*S-EM-1(TY-2)	49.97	*NA*	*0.00*	0.9	44.97	0.9	44.97	0.8	39.98	*NA*	*0.00*	1.0	*NA*	129.92
Existing Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.33	*NA*	*0.00*	0.9	0.30	1.0	0.33	0.8	0.26	NA	*0.00*	1.0	*NA*	0.89
Tidal Open Water	**OW/Shoreline B	0.08	0.7	0.06	0.3	0.02	0.6	0.05	0.2	0.02	0.3	0.02	1.0	*NA*	0.17
Upper Tidal Wetland	IM-1	0.31	0.5	0.16	0.7	0.22	0.6	0.19	0.7	0.22	0.4	0.12	1.0	*NA*	0.90

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Wet Meadow	WM-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*0.00*	1.0	*NA*	0.12
Upland Oldfield	*NA*	0.33	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**277.69**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-11: Binnen Kill North Alternative 2 – TY-20
2045 post construction; approximately 20 years of growth; compares existing to newly restored hardwood swamps

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
New Hardwood Swamp	*FWW-SS	22.02	*NA*	*0.00*	0.9	19.82	1.0	22.02	0.8	17.62	NA	*0.00*	1.0	*NA*	59.45
Existing Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Shallow Emergent Wetland	S-EM-2/S-EM-2	74.07	*NA*	*0.00*	1.0	74.07	1.0	74.07	0.8	59.26	*NA*	*0.00*	1.0	*NA*	207.40
Shrub Swamp	*FWW-SS	0.33	*NA*	*0.00*	0.9	0.30	1.0	0.33	0.8	0.26	NA	*0.00*	1.0	*NA*	0.89
Tidal Open Water	**OW/Shoreline B	0.08	0.7	0.06	0.3	0.02	0.6	0.05	0.2	0.02	0.3	0.02	1.0	*NA*	0.17
Upper Tidal Wetland	IM-1	0.31	0.5	0.16	0.7	0.22	0.6	0.19	0.7	0.22	0.4	0.12	1.0	*NA*	0.90
Wet Meadow	*FWW-SS	0.05	*NA*	*0.00*	0.9	0.05	1.0	0.05	0.8	0.04	NA	*0.00*	1.0	*NA*	0.14

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Oldfield	*NA*	0.33	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**289.90**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-12: Binnen Kill North Alternative 2 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change although sea level change will not impact this component

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	30.08	*NA*	*0.00*	0.9	27.07	0.9	27.07	0.8	24.06	*NA*	*0.00*	1.0	*NA*	78.21
Shallow Emergent Wetland	S-EM-2/S-EM-2	74.07	*NA*	*0.00*	1.0	74.07	1.0	74.07	0.8	59.26	*NA*	*0.00*	1.0	*NA*	207.40
Shrub Swamp	*FWW-SS	0.33	*NA*	*0.00*	0.9	0.30	1.0	0.33	0.8	0.26	NA	*0.00*	1.0	*NA*	0.89
Tidal Open Water	**OW/Shoreline B	0.08	0.7	0.06	0.3	0.02	0.6	0.05	0.2	0.02	0.3	0.02	1.0	*NA*	0.17
Upper Tidal Wetland	IM-1	0.31	0.5	0.16	0.7	0.22	0.6	0.19	0.7	0.22	0.4	0.12	1.0	*NA*	0.90
Wet Meadow	FO-1	0.05	*NA*	*0.0*	0.9	0.05	0.9	0.05	0.8	0.04	*NA*	*0.00*	1.0	*NA*	0.13
Upland Oldfield	*NA*	0.33	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Roadway	*NA*	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**287.69**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-13: Binnen Kill North Alternative 3 – TY-0
Existing conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	42.18	*NA*	*0.0*	0.8	33.74	0.8	33.74	0.7	29.53	*NA*	*NA*	1.0	*NA*	97.01
Hardwood Swamp	FO-1	8.06	*NA*	*0.0*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*NA*	1.0	*NA*	20.96
Phalaris arundinacea Wetland	RC-1	14.14	*NA*	*0.0*	0.8	11.31	1.0	14.14	0.7	9.90	*NA*	*NA*	1.0	*NA*	35.35
Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.0*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*NA*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.0*	0.9	0.32	1.0	0.36	0.8	0.29	NA	NA	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.21	0.6	0.13	1.0	0.21	0.7	0.15	0.6	0.13	0.3	0.06	1.0	*NA*	0.67
Upper Tidal Wetland	IM-1	0.08	0.5	0.04	0.7	0.06	0.6	0.05	0.7	0.06	0.4	0.03	1.0	*NA*	0.23

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Wet Meadow	WM-1	0.05	*NA*	*NA*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*NA*	1.0	*NA*	0.12
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	0.45	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**222.94**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-14: Binnen Kill North Alternative 3 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels; compares existing and newly restored shallow emergent wetlands

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Existing Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
New Shallow Emergent Wetland	S-EM-2/S-EM-2	53.76	*NA*	*0.00*	0.9	48.38	0.9	48.38	0.8	43.01	*NA*	*0.00*	1.0	*NA*	139.78
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.16	0.6	0.10	1.0	0.16	0.7	0.11	0.6	0.10	0.3	0.05	1.0	*NA*	0.51
Upper Tidal Wetland	*IM-1 (TY-2)	0.12	0.5	0.06	0.6	0.07	0.6	0.07	0.7	0.08	0.4	0.05	1.0	*NA*	0.34
Wet Meadow	WM-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*0.00*	1.0	*NA*	0.12

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	3.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**230.30**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-15: Binnen Kill North Alternative 3 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Shallow Emergent Wetland	S-EM-2/S-EM-2	77.86	*NA*	*0.00*	1.0	77.86	1.0	77.86	0.8	62.29	*NA*	*0.00*	1.0	*NA*	218.01
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.16	0.6	0.10	1.0	0.16	0.7	0.11	0.6	0.10	0.3	0.05	1.0	*NA*	0.51
Upper Tidal Wetland	IM-1	0.12	0.5	0.06	0.7	0.08	0.6	0.07	0.7	0.08	0.4	0.05	1.0	*NA*	0.35
Wet Meadow	*FWW-SS	0.05	*NA*	*0.00*	0.9	0.05	1.0	0.05	0.8	0.04	NA	*0.00*	1.0	*NA*	0.14
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	3.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**241.08**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-16: Binnen Kill North Alternative 3 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change although sea level change will not impact this component

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Shallow Emergent Wetland	S-EM-2/S-EM-2	77.86	*NA*	*0.00*	1.0	77.86	1.0	77.86	0.8	62.29	*NA*	*0.00*	1.0	*NA*	218.01
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.16	0.6	0.10	1.0	0.16	0.7	0.11	0.6	0.10	0.3	0.05	1.0	*NA*	0.51
Upper Tidal Wetland	IM-1	0.12	0.5	0.06	0.7	0.08	0.6	0.07	0.7	0.08	0.4	0.05	1.0	*NA*	0.35
Wet Meadow	FO-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.8	0.04	*NA*	*0.00*	1.0	*NA*	0.13
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Oldfield	*NA*	3.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**241.07**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-17: Binnen Kill North Alternative 4 – TY-0
Existing conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	42.18	*NA*	*0.00*	0.8	33.74	0.8	33.74	0.7	29.53	*NA*	*0.00*	1.0	*NA*	97.01
Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Phalaris arundinacea Wetland	RC-1	14.14	*NA*	*0.00*	0.8	11.31	1.0	14.14	0.7	9.90	*NA*	*0.00*	1.0	*NA*	35.35
Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.36	*NA*	*0.00*	0.9	0.32	1.0	0.36	0.8	0.29	NA	*0.00*	1.0	*NA*	0.97
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.21	0.6	0.13	1.0	0.21	0.7	0.15	0.6	0.13	0.3	0.06	1.0	*NA*	0.67
Upper Tidal Wetland	IM-1	0.08	0.5	0.04	0.7	0.06	0.6	0.05	0.7	0.06	0.4	0.03	1.0	*NA*	0.23
Wet Meadow	WM-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*0.00*	1.0	*NA*	0.12

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hayfield	*NA*	15.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Oldfield	*NA*	0.45	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**222.94**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-18: Binnen Kill North Alternative 4 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels; compares existing and newly restored hardwood swamps and shallow emergent wetlands

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
New Hardwood Swamp	*FWW-SS (TY-2)	22.02	*NA*	*0.00*	0.9	19.82	0.9	19.82	0.8	17.62	NA	*0.00*	1.0	*NA*	57.25
Existing Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
New Shallow Emergent Wetland	*S-EM-1(TY-2)	49.97	*NA*	*0.00*	0.9	44.97	0.9	44.97	0.8	39.98	*NA*	*0.00*	1.0	*NA*	129.92
Existing Shallow Emergent Wetland	S-EM-2/S-EM-2	24.10	*NA*	*0.00*	1.0	24.10	1.0	24.10	0.8	19.28	*NA*	*0.00*	1.0	*NA*	67.48
Shrub Swamp	*FWW-SS	0.33	*NA*	*0.00*	0.9	0.30	1.0	0.33	0.8	0.26	NA	*0.00*	1.0	*NA*	0.89
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Phragmites	Phrag-1	0.16	0.6	0.10	1.0	0.16	0.7	0.11	0.6	0.10	0.3	0.05	1.0	*NA*	0.51
Upper Tidal Wetland	IM-1	0.12	0.5	0.06	0.7	0.08	0.6	0.07	0.7	0.08	0.4	0.05	1.0	*NA*	0.35
Wet Meadow	WM-1	0.05	*NA*	*0.00*	0.9	0.05	0.9	0.05	0.6	0.03	*NA*	*0.00*	1.0	*NA*	0.12
Upland Oldfield	*NA*	0.33	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**277.63**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-19: Binnen Kill North Alternative 4 – TY-20
2045 post construction; approximately 20 years of growth; compares existing and newly restored hardwood swamps

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
New Hardwood Swamp	*FWW-SS	22.02	*NA*	*0.00*	0.9	19.82	1.0	22.02	0.8	17.62	NA	*0.00*	1.0	*NA*	59.45
Existing Hardwood Swamp	FO-1	8.06	*NA*	*0.00*	0.9	7.25	0.9	7.25	0.8	6.45	*NA*	*0.00*	1.0	*NA*	20.96
Shallow Emergent Wetland	S-EM-2/S-EM-2	74.07	*NA*	*0.00*	1.0	74.07	1.0	74.07	0.8	59.26	*NA*	*0.00*	1.0	*NA*	207.40
Shrub Swamp	*FWW-SS	0.33	*NA*	*0.00*	0.9	0.30	1.0	0.33	0.8	0.26	NA	*0.00*	1.0	*NA*	0.89
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.16	0.6	0.10	1.0	0.16	0.7	0.11	0.6	0.10	0.3	0.05	1.0	*NA*	0.51
Upper Tidal Wetland	IM-1	0.12	0.5	0.06	0.7	0.08	0.6	0.07	0.7	0.08	0.4	0.05	1.0	*NA*	0.35
Wet Meadow	*FWW-SS	0.05	*NA*	*0.00*	0.9	0.05	1.0	0.05	0.8	0.04	NA	*0.00*	1.0	*NA*	0.14

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Oldfield	*NA*	0.33	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**289.84**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Table 2-20: Binnen Kill North Alternative 4 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change although sea level change will not impact this component

Wetland Type/Name	EPW-Sample Point ID	Area (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	30.08	*NA*	*0.00*	0.9	27.07	0.9	27.07	0.8	24.06	*NA*	*0.00*	1.0	*NA*	78.21
Shallow Emergent Wetland	S-EM-2/S-EM-2	74.07	*NA*	*0.00*	1.0	74.07	1.0	74.07	0.8	59.26	*NA*	*0.00*	1.0	*NA*	207.40
Shrub Swamp	*FWW-SS	0.33	*NA*	*0.00*	0.9	0.30	1.0	0.33	0.8	0.26	NA	*0.00*	1.0	*NA*	0.89
Tidal Open Water	**OW/Shoreline B	0.07	0.7	0.05	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.15
Tidal Phragmites	Phrag-1	0.16	0.6	0.10	1.0	0.16	0.7	0.11	0.6	0.10	0.3	0.05	1.0	*NA*	0.51
Upper Tidal Wetland	IM-1	0.12	0.5	0.06	0.7	0.08	0.6	0.07	0.7	0.08	0.4	0.05	1.0	*NA*	0.35
Wet Meadow	FO-1	0.05	*NA*	*0.0*	0.9	0.05	0.9	0.05	0.8	0.04	*NA*	*0.00*	1.0	*NA*	0.13

Wetland Type/Name	EPW-Sample Point ID	Area (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Oldfield	*NA*	0.33	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**105.71**													**287.63**

** EPW Sample Point and FCI from Binnen Kill), ** EPW Sample Point and FCI from Charles Rider Park*

Binnen Kill South

Binnen Kill South comprises approximately 48.79 acres. Two restoration alternatives were evaluated for this site component. The existing (Table 2-22) total FCU for this site after 50 years is 86.73 (Table 2-23). Tables 2-24 through 2-31 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for each of the two alternatives.

Alternative 1 proposes the following:

- restore 13.85 acres of wetlands by treating invasive vegetation and planting native species;
- restore 7.19 acres of tidal wetlands on the eastern side of the site by treating invasive vegetation, expanding the channel to connect with a proposed side channel, grading fringe wetlands, and planting native species;
- restore 0.28 acres of tidal wetlands on the western side of the site by treating invasive vegetation and planting native species;
- create a road crossing to accommodate vehicular traffic; and
- restore 14.85 acres of side channels (five in total) and riparian corridor by doing the following:
    - restore a side channel to connect with the Hudson River, which will maintain flow during large precipitation events and spring high tides, up to and including the projected mean tide in 2075;
    - regrading the corridor to establish the riparian buffer and tidal wetlands;
    - avoiding excavation of native soils; and
    - planting native vegetation.

Alternative 1 yields a total FCU after 50 years of 107.22 (Table 2-27).

Alternative 2 proposes the following:

- restore 13.85 acres of wetlands by treating invasive vegetation and planting native species;
- restore 7.19 acres of tidal wetlands on the eastern side of the site by treating invasive vegetation, expanding the channel to connect with a proposed side channel, grading fringe wetlands, and planting native vegetation;
- restore 0.28 acres of tidal wetlands on the western side of the site by treating invasive vegetation and planting native species;

- restore a side channel to connect with the Hudson River, which will maintain flow during low tides;
- regrading the corridor to establish tidal wetlands;
- avoiding excavation of native soils; and
- planting native vegetation.

Alternative 2 yields a total FCU after 50 years of 160.30 (Table 2-31).

Table 2-21: Binnen Kill South Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	78.80	--	--	86.73
Alternative 1	78.80	90.24	92.36	107.22
Alternative 2	78.80	147.24	149.06	160.30

Table 2-22: Binnen Kill South Existing Conditions - TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	0.29	*NA*	*0.00*	0.8	0.23	0.8	0.23	0.7	0.20	*NA*	*0.00*	1.0	*NA*	0.67
Hardwood Swamp	FO-1	5.34	*NA*	*0.00*	0.9	4.81	0.9	4.81	0.8	4.27	*NA*	*0.00*	1.0	*NA*	13.88
Lower Tidal Wetland	LIM-1	0.21	0.9	0.19	0.9	0.19	0.9	0.19	0.7	0.15	0.5	0.11	1.0	*NA*	0.82
Shallow Emergent Wetland	S-EM-2/S-EM-2	1.91	*NA*	*0.00*	1.0	1.91	1.0	1.91	0.8	1.53	*NA*	*0.00*	1.0	*NA*	5.35
Tidal Open Water	**OW/Shoreline B	0.13	0.7	0.09	0.3	0.04	0.6	0.08	0.2	0.03	0.3	0.04	1.0	*NA*	0.27
Tidal Phragmites	Phrag-1	5.34	0.6	3.20	1.0	5.34	0.7	3.74	0.6	3.20	0.3	1.60	1.0	*NA*	17.09
Hardwood Swamp with Phragmites Understory	FO-2	16.33	*NA*	*0.00*	0.9	14.70	0.7	11.43	0.7	11.43	*NA*	*0.00*	1.0	*NA*	37.56
Upper Tidal Wetland	IM-1	1.09	0.5	0.55	0.7	0.76	0.6	0.65	0.7	0.76	0.4	0.44	1.0	*NA*	3.16

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Oldfield	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	15.71	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Mixed Forest	*NA*	0.48	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	1.9	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**78.80**

*** EPW Sample Point and FCI from Charles Rider Park*

Table 2-23: Binnen Kill South Existing Conditions – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	0.29	*NA*	*0.00*	0.8	0.23	0.8	0.23	0.7	0.20	*NA*	*0.00*	1.0	*NA*	0.67
Hardwood Swamp	FO-1	1.91	*NA*	*0.00*	0.9	1.72	0.9	1.72	0.8	1.53	*NA*	*0.00*	1.0	*NA*	4.97
Lower Tidal Wetland	LIM-1	0.12	0.9	0.11	0.9	0.11	0.9	0.11	0.7	0.08	0.5	0.06	1.0	*NA*	0.47
Shallow Emergent Wetland	S-EM-2/S-EM-2	0.01	*NA*	*0.00*	1.0	0.01	1.0	0.01	0.8	0.01	*NA*	*0.00*	1.0	*NA*	0.03
Tidal Open Water	**OW/Shoreline B	0.23	0.7	0.16	0.3	0.07	0.6	0.14	0.2	0.05	0.3	0.07	1.0	*NA*	0.48
Tidal Phragmites	Phrag-1	11.13	0.6	6.68	1.0	11.13	0.7	7.79	0.6	6.68	0.3	3.34	1.0	*NA*	35.62
Hardwood Swamp with Phragmites Understory	FO-2	10.89	*NA*	*0.00*	0.9	9.80	0.7	7.62	0.7	7.62	*NA*	*0.00*	1.0	*NA*	25.05
Upper Tidal Wetland	IM-1	6.71	0.5	3.36	0.7	4.70	0.6	4.03	0.7	4.70	0.4	2.68	1.0	*NA*	19.46

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Oldfield	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	15.29	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Mixed Forest	*NA*	0.48	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	1.67	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**86.73**

*** EPW Sample Point and FCI from Charles Rider Park*

Table 2-24: Binnen Kill South Alternative 1 – TY-0
Existing conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	0.29	*NA*	*0.00*	0.8	0.23	0.8	0.23	0.7	0.20	*NA*	*0.00*	1.0	*NA*	0.67
Hardwood Swamp	FO-1	5.34	*NA*	*0.00*	0.9	4.81	0.9	4.81	0.8	4.27	*NA*	*0.00*	1.0	*NA*	13.88
Lower Tidal Wetland	LIM-1	0.21	0.9	0.19	0.9	0.19	0.9	0.19	0.7	0.15	0.5	0.11	1.0	*NA*	0.82
Shallow Emergent Wetland	S-EM-2/S-EM-2	1.91	*NA*	*0.00*	1.0	1.91	1.0	1.91	0.8	1.53	*NA*	*0.00*	1.0	*NA*	5.35
Tidal Open Water	**OW/Shoreline B	0.13	0.7	0.09	0.3	0.04	0.6	0.08	0.2	0.03	0.3	0.04	1.0	*NA*	0.27
Tidal Phragmites	Phrag-1	5.34	0.6	3.20	1.0	5.34	0.7	3.74	0.6	3.20	0.3	1.60	1.0	*NA*	17.09
Hardwood Swamp with Phragmites Understory	FO-2	16.33	*NA*	*0.00*	0.9	14.70	0.7	11.43	0.7	11.43	*NA*	*0.00*	1.0	*NA*	37.56

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upper Tidal Wetland	IM-1	1.09	0.5	0.55	0.7	0.76	0.6	0.65	0.7	0.76	0.4	0.44	1.0	*NA*	3.16
Upland Oldfield	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	15.71	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Mixed Forest	*NA*	0.48	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	1.9	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**78.80**

*** EPW Sample Point and FCI from Charles Rider Park*

Table 2-25: Binnen Kill South Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels; compares existing and newly restored hardwood swamps and upper tidal wetlands

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	0.29	*NA*	*0.00*	0.8	0.23	0.8	0.23	0.7	0.20	*NA*	*0.00*	1.0	*NA*	0.67
New Hardwood Swamp	*FWW-SS (TY-2)	11.36	*NA*	*0.00*	0.9	10.22	0.9	10.22	0.8	9.09	NA	*0.00*	1.0	*NA*	29.54
Existing Hardwood Swamp	FO-1	5.34	*NA*	*0.00*	0.9	4.81	0.9	4.81	0.8	4.27	*NA*	*0.00*	1.0	*NA*	13.88
Lower Tidal Wetland	LIM-1	6.23	0.9	5.61	0.9	5.61	0.9	5.61	0.7	4.36	0.5	3.12	1.0	*NA*	24.30
Tidal Mudflat	***UV-1	1.41	0.9	1.27	0.8	1.13	0.9	1.27	0.7	0.99	0.4	0.56	1.0	*NA*	5.22
Tidal Open Water	**OW/Shoreline B	0.13	0.7	0.09	0.3	0.04	0.6	0.08	0.2	0.03	0.3	0.04	1.0	*NA*	0.27
Hardwood Swamp with Phragmites Understory	FO-2	0.25	*NA*	*0.00*	0.9	0.23	0.7	0.18	0.7	0.18	*NA*	*0.00*	1.0	*NA*	0.58

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
New Upper Tidal Wetland	*IM-1 (TY-2)	4.51	0.5	2.26	0.6	2.71	0.6	2.71	0.7	3.16	0.4	1.80	1.0	*NA*	12.63
Existing Upper Tidal Wetland	IM-1	1.09	0.5	0.55	0.7	0.76	0.6	0.65	0.7	0.76	0.4	0.44	1.0	*NA*	3.16
Upland Oldfield	*NA*	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	9.40	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Mixed Forest	*NA*	0.14	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	8.18	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals	**48.79**													**90.24**

** EPW Sample Point and FCI from Binnen Kill, ** EPW Sample Point and FCI from Charles Rider Park, ***EPW Sample Point and FCI from Schodack Island (Exclude tidal Fish Function)*

Table 2-26: Binnen Kill South Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	0.29	*NA*	*0.00*	0.8	0.23	0.8	0.23	0.7	0.20	*NA*	*0.00*	1.0	*NA*	0.67
Hardwood Swamp	*FWW-SS	16.70	*NA*	*0.00*	0.9	15.03	1.0	16.70	0.8	13.36	NA	*0.00*	1.0	*NA*	45.09
Lower Tidal Wetland	LIM-1	6.23	0.9	5.61	0.9	5.61	0.9	5.61	0.7	4.36	0.5	3.12	1.0	*NA*	24.30
Mud Flat	***UV-1	1.41	0.9	1.27	0.8	1.13	0.9	1.27	0.7	0.99	0.4	0.56	1.0	*NA*	5.22
Tidal Open Water	**OW/Shoreline B	0.13	0.7	0.09	0.3	0.04	0.6	0.08	0.2	0.03	0.3	0.04	1.0	*NA*	0.27
Hardwood Swamp with Phragmites Understory	FO-2	0.25	*NA*	*0.00*	0.9	0.23	0.7	0.18	0.7	0.18	*NA*	*0.00*	1.0	*NA*	0.58
Upper Tidal Wetland	IM-1	5.60	0.5	2.80	0.7	3.92	0.6	3.36	0.7	3.92	0.4	2.24	1.0	*NA*	16.24
Upland Oldfield	*NA*	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hardwood Forest	*NA*	9.40	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Mixed Forest	*NA*	0.14	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	8.18	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**92.36**

** EPW Sample Point and FCI from Binnen Kill, ** EPW Sample Point and FCI from Charles Rider Park, ***EPW Sample Point and FCI from Schodack Island (Exclude tidal Fish Function)*

Table 2-27: Binnen Kill South Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	0.29	*NA*	*0.00*	0.8	0.23	0.8	0.23	0.7	0.20	*NA*	*0.00*	1.0	*NA*	0.67
Hardwood Swamp	FO-1	12.04	*NA*	*0.00*	0.9	10.84	0.9	10.84	0.8	9.63	*NA*	*0.00*	1.0	*NA*	31.30
Lower Tidal Wetland	LIM-1	6.19	0.9	5.57	0.9	5.57	0.9	5.57	0.7	4.33	0.5	3.10	1.0	*NA*	24.14
Mud Flat	***UV-1	1.41	0.9	1.27	0.8	1.13	0.9	1.27	0.7	0.99	0.4	0.56	1.0	*NA*	5.22
Tidal Open Water	**OW/Shoreline B	0.38	0.7	0.27	0.3	0.11	0.6	0.23	0.2	0.08	0.3	0.11	1.0	*NA*	0.80
Upper Tidal Wetland	IM-1	15.55	0.5	7.78	0.7	10.89	0.6	9.33	0.7	10.89	0.4	6.22	1.0	*NA*	45.10
Upland Oldfield	NA	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	9.01	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Mixed Forest	*NA*	0.14	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Shrubland	*NA*	3.32	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	NA	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**107.22**

*** EPW Sample Point and FCI from Charles Rider Park, ***EPW Sample Point and FCI from Schodack Island (Exclude tidal Fish Function)*

Table 2-28: Binnen Kill South Alternative 2 – TY-0
Existing conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	Phrag-2	0.29	*NA*	*0.00*	0.8	0.23	0.8	0.23	0.7	0.20	*NA*	*0.00*	1.0	*NA*	0.67
Hardwood Swamp	FO-1	5.34	*NA*	*0.00*	0.9	4.81	0.9	4.81	0.8	4.27	*NA*	*0.00*	1.0	*NA*	13.88
Lower Tidal Wetland	LIM-1	0.21	0.9	0.19	0.9	0.19	0.9	0.19	0.7	0.15	0.5	0.11	1.0	*NA*	0.82
Shallow Emergent Wetland	S-EM-2/S-EM-2	1.91	*NA*	*0.00*	1.0	1.91	1.0	1.91	0.8	1.53	*NA*	*0.00*	1.0	*NA*	5.35
Tidal Open Water	**OW/Shoreline B	0.13	0.7	0.09	0.3	0.04	0.6	0.08	0.2	0.03	0.3	0.04	1.0	*NA*	0.27
Tidal Phragmites	Phrag-1	5.34	0.6	3.20	1.0	5.34	0.7	3.74	0.6	3.20	0.3	1.60	1.0	*NA*	17.09
Hardwood Swamp with Phragmites Understory	FO-2	16.33	*NA*	*0.00*	0.9	14.70	0.7	11.43	0.7	11.43	*NA*	*0.00*	1.0	*NA*	37.56

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upper Tidal Wetland	IM-1	1.09	0.5	0.55	0.7	0.76	0.6	0.65	0.7	0.76	0.4	0.44	1.0	*NA*	3.16
Upland Oldfield	*NA*	0.06	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	15.71	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Mixed Forest	*NA*	0.48	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	1.9	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**78.80**

*** EPW Sample Point and FCI from Charles Rider Park*

Table 2-29: Binnen Kill South Alternative 2 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels; compares existing and newly restored hardwood swamps and upper tidal wetlands

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
New Hardwood Swamp	*FWW-SS (TY-2)	11.79	*NA*	*0.00*	0.9	10.61	0.9	10.61	0.8	9.43	NA	*0.00*	1.0	*NA*	30.65
Existing Hardwood Swamp	FO-1	5.34	*NA*	*0.00*	0.9	4.81	0.9	4.81	0.8	4.27	*NA*	*0.00*	1.0	*NA*	13.88
Lower Tidal Wetland	LIM-1	13.53	0.9	12.18	0.9	12.18	0.9	12.18	0.7	9.47	0.5	6.77	1.0	*NA*	52.77
Tidal Mudflat	***UV-1	2.64	0.9	2.38	0.8	2.11	0.9	2.38	0.7	1.85	0.4	1.06	1.0	*NA*	9.77
Tidal Open Water	**OW/Shoreline B	1.53	0.7	1.07	0.3	0.46	0.6	0.92	0.2	0.31	0.3	0.46	1.0	*NA*	3.21
New Upper Tidal Wetland	IM-1	11.69	0.5	5.85	0.7	8.18	0.6	7.01	0.7	8.18	0.4	4.68	1.0	*NA*	33.90
Existing Upper Tidal Wetland	*IM-1 (TY-2)	1.09	0.5	0.55	0.6	0.65	0.6	0.65	0.7	0.76	0.4	0.44	1.0	*NA*	3.05
Upland Oldfield	*NA*	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland Hardwood Forest	*NA*	0.57	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	0.15	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**147.24**

** EPW Sample Point and FCI from Binnen Kill, ** EPW Sample Point and FCI from Charles Rider Park, ***EPW Sample Point and FCI from Schodack Island (Exclude tidal Fish Function)*

Table 2-30: Binnen Kill South Alternative 2 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	*FWW-SS	17.13	*NA*	*0.00*	0.9	15.42	1.0	17.13	0.8	13.70	NA	*0.00*	1.0	*NA*	46.25
Lower Tidal Wetland	LIM-1	13.53	0.9	12.18	0.9	12.18	0.9	12.18	0.7	9.47	0.5	6.77	1.0	*NA*	52.77
Mud Flat	***UV-1	2.64	0.9	2.38	0.8	2.11	0.9	2.38	0.7	1.85	0.4	1.06	1.0	*NA*	9.77
Tidal Open Water	**OW/Shoreline B	1.53	0.7	1.07	0.3	0.46	0.6	0.92	0.2	0.31	0.3	0.46	1.0	*NA*	3.21
Upper Tidal Wetland	IM-1	12.78	0.5	6.39	0.7	8.95	0.6	7.67	0.7	8.95	0.4	5.11	1.0	*NA*	37.06
Upland Oldfield	*NA*	0.02	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Hardwood Forest	*NA*	0.57	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Shrubland	*NA*	0.15	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
	Totals:	48.79													149.06

** EPW Sample Point and FCI from Binnen Kill, ** EPW Sample Point and FCI from Charles Rider Park, ***EPW Sample Point and FCI from Schodack Island (Exclude tidal Fish Function)*

Table 2-31: Binnen Kill South Alternative 2 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Hardwood Swamp	FO-1	11.04	*NA*	*0.00*	0.9	9.94	0.9	9.94	0.8	8.83	*NA*	*0.00*	1.0	*NA*	28.70
Lower Tidal Wetland	LIM-1	24.76	0.9	22.28	0.9	22.28	0.9	22.28	0.7	17.33	0.5	12.38	1.0	*NA*	96.56
Mud Flat	***UV-1	2.29	0.9	2.06	0.8	1.83	0.9	2.06	0.7	1.60	0.4	0.92	1.0	*NA*	8.47

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	**OW/Shoreline B	2.94	0.7	2.06	0.3	0.88	0.6	1.76	0.2	0.59	0.3	0.88	1.0	*NA*	6.17
Upper Tidal Wetland	IM-1	7.03	0.5	3.52	0.7	4.92	0.6	4.22	0.7	4.92	0.4	2.81	1.0	*NA*	20.39
Upland Hardwood Forest	*NA*	0.29	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Upland Roadway	*NA*	0.44	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**48.79**													**160.30**

*** EPW Sample Point and FCI from Charles Rider Park, ***EPW Sample Point and FCI from Schodack Island (Exclude tidal Fish Function)*

Charles Rider Park

Charles Rider Park comprises approximately 1.11 acres. The existing total FCU for this site after 50 years is 0.65 (Table 2-34). One restoration alternative was evaluated for this site. Tables 2-35 through 2-38 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for each of the four alternatives. Alternative 1 proposes the following:

- Restore 0.12 acres of interstitial rock plantings by reinforcing rock stabilization, filling pockets with soil, and planting native vegetation;
- Restore 0.29 acres of tidal wetlands at the north end of the site by reinforcing toe protection, importing soil and grading between the top of the bank and the riprap, and planting native vegetation; and
- Restore 0.70 acres of tidal wetlands at the south end of the site by removing the remnant boat launch, reinforcing toe protection (or installing it where it does not currently exist), grading the bank back to the existing gravel surface, importing soil and grading between the top of the bank and the riprap, and planting native vegetation.

Alternative 1 yields a total FCU after 50 years of 1.93 (Table 2-38).

Table 2-32: Charles Rider Park Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	0.53	--	--	0.65
Alternative 1	0.53	1.74	1.79	1.93

Table 2-33: Charles Rider Park Existing Conditions – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU	Average FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage			
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU		
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.40	*NA*	*0.00*	0.1	0.04	0.5	0.20	0.2	0.08	0.2	0.08	1.0	*NA*	0.40	0.08
Tidal Open Water (Rock Shoreline)	OW/Shoreline B	0.06	0.7	0.04	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.13	0.03
Upland	*NA*	0.65	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**1.11**													**0.53**	**0.11**

Table 2-34: Charles Rider Park Existing Conditions – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU	Average FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage			
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU		
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.47	*NA*	*0.00*	0.1	0.05	0.5	0.24	0.2	0.09	0.2	0.09	1.0	*NA*	0.47	0.09
Tidal Open Water (Rock Shoreline)	OW/Shoreline B	0.09	0.7	0.06	0.3	0.03	0.6	0.05	0.2	0.02	0.3	0.03	1.0	*NA*	0.18	0.04
Upland	*NA*	0.56	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**1.11**													**0.65**	**0.13**

Table 2-35: Charles Rider Park Alternative 1 – TY-0
Existing conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU	Average FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage			
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU		
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.40	*NA*	*0.00*	0.1	0.04	0.5	0.20	0.2	0.08	0.2	0.08	1.0	*NA*	0.40	0.08
Tidal Open Water (Rock Shoreline)	OW/Shoreline B	0.06	0.7	0.04	0.3	0.02	0.6	0.04	0.2	0.01	0.3	0.02	1.0	*NA*	0.13	0.03
Upland	*NA*	0.65	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**1.11**													**0.53**	**0.11**

Table 2-36: Charles Rider Park Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU	Average FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage			
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU		
Tidal Open Water	OW/Bulkhead	0.14	*NA*	*0.00*	0.1	0.01	0.5	0.07	0.2	0.03	0.2	0.03	1.0	*NA*	0.14	0.03
Upper Tidal Wetland	*IM-1 (TY-2)	0.57	0.5	0.29	0.6	0.34	0.6	0.34	0.7	0.40	0.4	0.23	1.0	*NA*	1.60	0.32
Upland	*NA*	0.4	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**1.11**													**1.74**	**0.35**

** EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-37: Charles Rider Park Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU	Average FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage			
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU		
Tidal Open Water	OW/Bulkhead	0.14	*NA*	*0.00*	0.1	0.01	0.5	0.07	0.2	0.03	0.2	0.03	1.0	*NA*	0.14	0.03
Upper Tidal Wetland	*IM-1	0.57	0.5	0.29	0.7	0.40	0.6	0.34	0.7	0.40	0.4	0.23	1.0	*NA*	1.65	0.33
Upland	*NA*	0.4	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**1.11**													**1.79**	**0.36**

** EPW Sample Point and FCI from Binnen Kill*

Table 2-38: Charles Rider Park Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU	Average FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage			
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU		
Tidal Open Water	OW/Bulkhead	0.36	*NA*	*0.00*	0.1	0.04	0.5	0.18	0.2	0.07	0.2	0.07	1.0	*NA*	0.36	0.07
Upper Tidal Wetland	*IM-1	0.54	0.5	0.27	0.7	0.38	0.6	0.32	0.7	0.38	0.4	0.22	1.0	*NA*	1.57	0.31
Upland	*NA*	0.21	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**1.11**													**1.93**	**0.39**

** EPW Sample Point and FCI from Binnen Kill*

Henry Hudson Park

Henry Hudson Park comprises approximately 5.65 acres. The existing total FCU for this site after 50 years is 0.90 (Table 2-41). Two restoration alternatives were evaluated for this site. Tables 2-42 through 2-49 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for each of the two alternatives.

Alternative 1 proposes the following:

- restore 3.59 acres of tidal wetlands in the western portion of the site by treating invasive plant species, excavating soils to achieve tidal wetland hydrology, installing shoreline bank stabilization, and planting native vegetation;
- restore 0.43 acres of vegetated riprap by keeping existing timber cribbing, replacing concrete caps with riprap and conducting minor grading, filling the void spaces with soil, and planting native vegetation; and
- restore 0.18 acres of tidal wetlands in the cove at the south end of the site by stabilizing the existing scour, installing coir log toe protection, and planting native vegetation.

Alternative 1 yields a total FCU after 50 years of 12.44 (Table 2-45).

Alternative 2 proposes the following:

- restore 0.41 acres of tidal wetlands at the northern end of the site by replacing timber cribbing and concrete caps with concrete cribbing, grading the top of the bank back approximately 10 feet, stabilizing the top of the bank with large rocks, importing soil and grading between the top of the bank and the concrete cribbing, and planting native vegetation;
- restore 0.09 acres of pocket wetlands by grading to allow tidal flushing, stabilizing the top of the bank with large rocks, and planting native vegetation;
- restore 3.59 acres of tidal wetlands in the western portion of the site by treating invasive plant species, excavating soils to achieve tidal wetland hydrology, installing shoreline bank stabilization, and planting native vegetation;
- restore 1.28 acres of tidal wetlands in the southern part of the site by replacing timber cribbing and concrete caps with riprap, grading the top of the bank back 50 to 90 feet, stabilizing the top of the bank with large rocks, importing soil and grading between top of bank and riprap, and planting native vegetation;
- restore 0.16 acres of tidal wetlands in the cove at the southern end of the site by stabilizing existing scour, installing coir log toe protection, and planting native

vegetation; and

- reinforce 0.11 acres of rock revetment by maintaining existing vegetation to the extent practicable.

Alternative 2 yields a total FCU after 50 years of 16.08 (Table 2-49).

Table 2-39: Henry Hudson Park Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	0.72	--	--	0.90
Alternative 1	0.72	11.92	12.33	12.44
Alternative 2	0.72	15.03	15.55	16.08

Table 2-40: Henry Hudson Park Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.43	*NA*	*0.00*	0.1	0.04	0.4	0.17	0.2	0.09	0.2	0.09	1.0	*NA*	0.39
Tidal Mudflat	Mud Flat-1	0.14	0.3	0.04	0.3	0.04	0.7	0.10	0.7	0.10	0.4	0.06	1.0	*NA*	0.34
Upland	*NA*	5.08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**0.72**

Table 2-41: Henry Hudson Park Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.56	*NA*	*0.00*	0.1	0.06	0.4	0.23	0.2	0.11	0.2	0.11	1.0	*NA*	0.51

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Mudflat	Mud Flat-1	0.16	0.3	0.05	0.3	0.05	0.7	0.11	0.7	0.11	0.4	0.06	1.0	*NA*	0.39
Upland	*NA*	4.92	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**0.90**

Table 2-42: Henry Hudson Park Alternative 1 – TY-0
Existing Conditions 2025, assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.43	*NA*	*0.00*	0.1	0.04	0.4	0.17	0.2	0.09	0.2	0.09	1.0	*NA*	0.39
Tidal Mudflat	Mud Flat-1	0.14	0.3	0.04	0.3	0.04	0.7	0.10	0.7	0.10	0.4	0.06	1.0	*NA*	0.34

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upland	*NA*	5.08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**0.72**

Table 2-43: Henry Hudson Park Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	*LIM-1	0.11	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	1.0	*NA*	0.50
Upper Tidal Wetland	*IM-1 (TY-2)	4.08	0.5	2.04	0.6	2.45	0.6	2.45	0.7	2.86	0.4	1.63	1.0	*NA*	11.42
Upland	*NA*	1.46	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**11.92**

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	

** EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-44: Henry Hudson Park Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	*LIM-1	0.11	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	1.0	*NA*	0.50
Upper Tidal Wetland	*IM-1	4.08	0.5	2.04	0.7	2.86	0.6	2.45	0.7	2.86	0.4	1.63	1.0	*NA*	11.83
Upland	*NA*	1.46	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**12.33**

** EPW Sample Point and FCI from Binnen Kill*

Table 2-45: Henry Hudson Park Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	OW/Bulkhead	0.13	*NA*	*0.00*	0.1	0.01	0.4	0.05	0.2	0.03	0.2	0.03	1.0	*NA*	0.12
Lower Tidal Wetland	*LIM-1	0.11	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	1.0	*NA*	0.50
Upper Tidal Wetland	*IM-1	4.08	0.5	2.04	0.7	2.86	0.6	2.45	0.7	2.86	0.4	1.63	1.0	*NA*	11.83
Upland	*NA*	1.33	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**12.44**

** EPW Sample Point and FCI from Binnen Kill*

Table 2-46: Henry Hudson Park Alternative 2 – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.43	*NA*	*0.00*	0.1	0.04	0.4	0.17	0.2	0.09	0.2	0.09	1.0	*NA*	0.39
Tidal Mudflat	Mud Flat-1	0.14	0.3	0.04	0.3	0.04	0.7	0.10	0.7	0.10	0.4	0.06	1.0	*NA*	0.34
Upland	*NA*	5.08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**0.72**

Table 2-47: Henry Hudson Park Alternative 2 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	*LIM-1	0.11	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	1.0	*NA*	0.50
Upper Tidal Wetland	*IM-1 (TY-2)	5.19	0.5	2.60	0.6	3.11	0.6	3.11	0.7	3.63	0.4	2.08	1.0	*NA*	14.53
Upland	*NA*	0.35	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**15.03**

** EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-48: Henry Hudson Park Alternative 2 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	*LIM-1	0.11	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	1.0	*NA*	0.50
Upper Tidal Wetland	*IM-1	5.19	0.5	2.60	0.7	3.63	0.6	3.11	0.7	3.63	0.4	2.08	1.0	*NA*	15.05
Upland	*NA*	0.35	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.65**													**15.55**

** EPW Sample Point and FCI from Binnen Kill*

Table 2-49: Henry Hudson Park Alternative 2 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	OW/Bulkhead	0.24	*NA*	*0.00*	0.1	0.02	0.4	0.10	0.2	0.05	0.2	0.05	1.0	*NA*	0.22
Lower Tidal Wetland	*LIM-1	0.11	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	0.9	0.10	1.0	*NA*	0.50
Upper Tidal Wetland	*IM-1	5.30	0.5	2.65	0.7	3.71	0.6	3.18	0.7	3.71	0.4	2.12	1.0	*NA*	15.37
	Totals:	**5.65**													**16.08**

** EPW Sample Point and FCI from Binnen Kill*

Schodack Island North

Schodack Island North comprises approximately 30.88 acres. The existing total FCU for this site after 50 years is 64.30 (Table 2-52). Tables 2-53 through 2-59 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for each of the two alternatives.

Two restoration alternatives were evaluated for this site. Alternative 1 proposes the following:

- enhance 1.80 acres of tidal wetlands at the northern end of the site by treating invasive vegetation and planting native species;
- enhance 2.31 acres of tidal wetlands and converting a side channel connection along the western portion of the site by treating invasive vegetation, converting wetlands to a side channel connection point with fringe tidal wetlands, and stabilizing the shoreline as necessary for side channel connection;
- create a road crossing to accommodate vehicular traffic and redirecting a ski trail to an existing road;
- restore 2.82 acres of side channel and riparian corridor by creasing a side channel to connect with the Hudson River (which will maintain flow during large precipitation events and spring high tides) and regrading the corridor to establish a riparian buffer and tidal wetlands; and
- restore 15.69 acres of tidal wetlands at the southern end of the site by treating invasive vegetation, expanding the channel cross section to convey low tide flow, grading the wetland floodplain bench and planting native vegetation.

Alternative 1 yields a total FCU after 50 years of 75.59 (Table 2-56).

Alternative 2 proposes the following:

- restore 1.80 acres of tidal wetlands at the northern end of the site by treating invasive vegetation and planting native species;
- restore 2.31 acres of tidal wetlands and convert to a side channel connection by treating invasive vegetation, converting wetlands to a side channel connection point with fringe tidal wetlands, and stabilizing the shoreline as necessary for side channel connection;
- create a road crossing to accommodate vehicular traffic and redirecting a ski trail to the existing road;
- restore 9.09 acres of side channel and tidal wetland corridor by creating a side channel to connect with the Hudson River (which will maintain flow during low

tide) and regrading the corridor to establish tidal wetlands; and

- restore 15.69 acres of tidal wetlands at the southern end of the site by treating invasive vegetation, expanding the channel cross section to convey low tide flow, grading the wetland floodplain bench, and planting native vegetation.

Alternative 2 yields a total FCU after 50 years of 93.40 (Table 2-60).

Table 2-50: Schodack Island North Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	54.42	--	--	64.30
Alternative 1	54.42	62.34	71.33	75.59
Alternative 2	54.42	81.84	93.78	93.40

Table 2-51: Schodack Island North Existing Condition -TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	0.77	0.9	0.69	0.6	0.46	0.9	0.69	0.8	0.62	0.4	0.31	1.0	*NA*	2.77
Tidal Open Water	*OW/Bulkhead	1.01	*NA*	*0.00*	0.1	0.10	0.4	0.40	0.2	0.20	0.2	0.20	1.0	*NA*	0.91
Phragmites	Phrag-1	6.07	0.5	3.04	0.8	4.86	0.7	4.25	0.7	4.25	0.4	2.43	1.0	*NA*	18.82
Scrub/Shrub	EM/SS-R-1	0.29	*NA*	*0.00*	1.0	0.29	0.8	0.23	0.9	0.26	0.5	0.15	1.0	*NA*	0.93
Typha angustifolia	EM-R-3	9.86	0.4	3.94	0.5	4.93	0.7	6.90	0.8	7.89	0.3	2.96	1.0	*NA*	26.62
Tidal Mudflat	UV-1	0.67	0.9	0.60	0.8	0.54	0.9	0.60	0.7	0.47	0.4	0.27	1.0	*NA*	2.48
Upper Tidal Wetland	EM-R-1	0.54	0.9	0.49	0.7	0.38	0.7	0.38	0.8	0.43	0.4	0.22	1.0	*NA*	1.89
Upland Road Crossing		0.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	11.16	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**54.42**

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-52: Schodack Island North Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	2.57	*NA*	*0.00*	0.1	0.26	0.4	1.03	0.2	0.51	0.2	0.51	1.0	*NA*	2.31
Phragmites	Phrag-1	8.23	0.5	4.12	0.8	6.58	0.7	5.76	0.7	5.76	0.4	3.29	1.0	*NA*	25.51
Upper Tidal Wetland	EM-R-1	10.42	0.9	9.38	0.7	7.29	0.7	7.29	0.8	8.34	0.4	4.17	1.0	*NA*	36.47
Upland Road Crossing		0.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	9.15	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**64.30**

EPW Sample Point and FCI from Henry Hudson Park

Table 2-53: Schodack Island North Alternative 1 – TY-0
Existing conditions 2025; assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	0.77	0.9	0.69	0.6	0.46	0.9	0.69	0.8	0.62	0.4	0.31	1.0	*NA*	2.77
Tidal Open Water	*OW/Bulkhead	1.01	*NA*	*0.00*	0.1	0.10	0.4	0.40	0.2	0.20	0.2	0.20	1.0	*NA*	0.91
Phragmites	Phrag-1	6.07	0.5	3.04	0.8	4.86	0.7	4.25	0.7	4.25	0.4	2.43	1.0	*NA*	18.82
Scrub/Shrub	EM/SS-R-1	0.29	*NA*	*0.00*	1.0	0.29	0.8	0.23	0.9	0.26	0.5	0.15	1.0	*NA*	0.93
Typha angustifolia	EM-R-3	9.86	0.4	3.94	0.5	4.93	0.7	6.90	0.8	7.89	0.3	2.96	1.0	*NA*	26.62
Tidal Mudflat	UV-1	0.67	0.9	0.60	0.8	0.54	0.9	0.60	0.7	0.47	0.4	0.27	1.0	*NA*	2.48
Upper Tidal Wetland	EM-R-1	0.54	0.9	0.49	0.7	0.38	0.7	0.38	0.8	0.43	0.4	0.22	1.0	*NA*	1.89
Upland Road Crossing	NA	0.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	11.16	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**54.42**

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-54: Schodack Island North Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	0.77	0.9	0.69	0.6	0.46	0.9	0.69	0.8	0.62	0.4	0.31	1.0	*NA*	2.77
Tidal Open Water	*OW/Bulkhead	1.01	*NA*	*0.00*	0.1	0.10	0.4	0.40	0.2	0.20	0.2	0.20	1.0	*NA*	0.91
Scrub/Shrub	EM/SS-R-1	5.36	*NA*	*0.00*	1.0	5.36	0.8	4.29	0.9	4.82	0.5	2.68	1.0	*NA*	17.15
Typha angustifolia	EM-R-3	0.10	0.4	0.04	0.5	0.05	0.7	0.07	0.8	0.08	0.3	0.03	1.0	*NA*	0.27
Tidal Mudflat	UV-1	1.42	0.9	1.28	0.8	1.14	0.9	1.28	0.7	0.99	0.4	0.57	1.0	*NA*	5.25

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upper Tidal Wetland	**IM-1 (TY-2)	12.85	0.5	6.43	0.6	7.71	0.6	7.71	0.7	9.00	0.4	5.14	1.0	*NA*	35.98
Upland Road Crossing	NA	0.25	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	9.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**62.34**

** EPW Sample Point and FCI from Henry Hudson Park, **EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-55: Schodack Island North Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	0.77	0.9	0.69	0.6	0.46	0.9	0.69	0.8	0.62	0.4	0.31	1.0	*NA*	2.77
Tidal Open Water	*OW/Bulkhead	1.01	*NA*	*0.00*	0.1	0.10	0.4	0.40	0.2	0.20	0.2	0.20	1.0	*NA*	0.91
Scrub/Shrub	EM/SS-R-1	5.36	*NA*	*0.00*	1.0	5.36	0.8	4.29	0.9	4.82	0.5	2.68	1.0	*NA*	17.15
Typha angustifolia	EM-R-3	0.10	0.4	0.04	0.5	0.05	0.7	0.07	0.8	0.08	0.3	0.03	1.0	*NA*	0.27
Tidal Mudflat	UV-1	1.42	0.9	1.28	0.8	1.14	0.9	1.28	0.7	0.99	0.4	0.57	1.0	*NA*	5.25
Upper Tidal Wetland	EM-R-1	12.85	0.9	11.57	0.7	9.00	0.7	9.00	0.8	10.28	0.4	5.14	1.0	*NA*	44.98
Upland Road Crossing	NA	0.25	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	9.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**71.33**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-56: Schodack Island North Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	2.04	*NA*	*0.00*	0.1	0.20	0.4	0.82	0.2	0.41	0.2	0.41	1.0	*NA*	1.84
Tidal Mudflat	UV-1	1.42	0.9	1.28	0.8	1.14	0.9	1.28	0.7	0.99	0.4	0.57	1.0	*NA*	5.25
Upper Tidal Wetland	EM-R-1	19.57	0.9	17.61	0.7	13.70	0.7	13.70	0.8	15.66	0.4	7.83	1.0	*NA*	68.50
Upland Road Crossing	NA	0.25	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	7.60	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**75.59**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-57: Schodack Island North Alternative 2 – TY-0
Existing conditions 2025, assuming they are the same as in 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	0.77	0.9	0.69	0.6	0.46	0.9	0.69	0.8	0.62	0.4	0.31	1.0	*NA*	2.77
Tidal Open Water	*OW/Bulkhead	1.01	*NA*	*0.00*	0.1	0.10	0.4	0.40	0.2	0.20	0.2	0.20	1.0	*NA*	0.91
Phragmites	Phrag-1	6.07	0.5	3.04	0.8	4.86	0.7	4.25	0.7	4.25	0.4	2.43	1.0	*NA*	18.82
Scrub/Shrub	EM/SS-R-1	0.29	*NA*	*0.00*	1.0	0.29	0.8	0.23	0.9	0.26	0.5	0.15	1.0	*NA*	0.93
Typha angustifolia	EM-R-3	9.86	0.4	3.94	0.5	4.93	0.7	6.90	0.8	7.89	0.3	2.96	1.0	*NA*	26.62
Tidal Mudflat	UV-1	0.67	0.9	0.60	0.8	0.54	0.9	0.60	0.7	0.47	0.4	0.27	1.0	*NA*	2.48
Upper Tidal Wetland	EM-R-1	0.54	0.9	0.49	0.7	0.38	0.7	0.38	0.8	0.43	0.4	0.22	1.0	*NA*	1.89
Upland Road Crossing		0.51	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	11.16	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**54.42**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-58: Schodack Island North Alternative 2 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	3.08	0.9	2.77	0.6	1.85	0.9	2.77	0.8	2.46	0.4	1.23	1.0	*NA*	11.09
Tidal Open Water	*OW/Bulkhead	1.79	*NA*	*0.00*	0.1	0.18	0.4	0.72	0.2	0.36	0.2	0.36	1.0	*NA*	1.61
Scrub/Shrub	EM/SS-R-1	4.04	*NA*	*0.00*	1.0	4.04	0.8	3.23	0.9	3.64	0.5	2.02	1.0	*NA*	12.93
Tidal Mudflat	UV-1	2.29	0.9	2.06	0.8	1.83	0.9	2.06	0.7	1.60	0.4	0.92	1.0	*NA*	8.47
Upper Tidal Wetland	**IM-1 (TY-2)	17.05	0.5	8.53	0.6	10.23	0.6	10.23	0.7	11.94	0.4	6.82	1.0	*NA*	47.74
Upland Road Crossing	NA	0.25	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	2.38	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**81.84**

** EPW Sample Point and FCI from Henry Hudson Park,* **EPW Sample Point and FCI from Binnen Kill (TY-2)

Table 2-59: Schodack Island North Alternative 2 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	3.08	0.9	2.77	0.6	1.85	0.9	2.77	0.8	2.46	0.4	1.23	1.0	*NA*	11.09
Tidal Open Water	*OW/Bulkhead	1.79	*NA*	*0.00*	0.1	0.18	0.4	0.72	0.2	0.36	0.2	0.36	1.0	*NA*	1.61
Scrub/Shrub	EM/SS-R-1	4.04	*NA*	*0.00*	1.0	4.04	0.8	3.23	0.9	3.64	0.5	2.02	1.0	*NA*	12.93
Tidal Mudflat	UV-1	2.29	0.9	2.06	0.8	1.83	0.9	2.06	0.7	1.60	0.4	0.92	1.0	*NA*	8.47
Upper Tidal Wetland	EM-R-1	17.05	0.9	15.35	0.7	11.94	0.7	11.94	0.8	13.64	0.4	6.82	1.0	*NA*	59.68
Upland Road Crossing	NA	0.25	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	2.38	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**93.78**

* EPW Sample Point and FCI from Henry Hudson Park

Table 2-60: Schodack Island North Alternative 2 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	5.76	0.9	5.18	0.6	3.46	0.9	5.18	0.8	4.61	0.4	2.30	1.0	*NA*	20.74
Tidal Open Water	*OW/Bulkhead	3.34	*NA*	*0.00*	0.1	0.33	0.4	1.34	0.2	0.67	0.2	0.67	1.0	*NA*	3.01
Tidal Mudflat	UV-1	2.13	0.9	1.92	0.8	1.70	0.9	1.92	0.7	1.49	0.4	0.85	1.0	*NA*	7.88
Upper Tidal Wetland	EM-R-1	17.65	0.9	15.89	0.7	12.36	0.7	12.36	0.8	14.12	0.4	7.06	1.0	*NA*	61.78
Upland Road Crossing	NA	0.25	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	1.75	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**30.88**													**93.40**

* EPW Sample Point and FCI from Henry Hudson Park

Schodack Island South

Schodack Island South comprises approximately 6.85 acres. The existing total FCU for this site after 50 years is 12.71 (Table 2-63). Tables 2-63 through 2-70 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for each of the two alternatives.

Two improvement scenarios were studied for this site. Alternative 1 proposes the following:

- restore 1.45 acres of riparian corridor and side channel by restoring a side channel to connect with the Hudson River (which will maintain flow during large precipitation events and spring high tides) and regrading the corridor to establish riparian buffer and tidal wetlands;
- create a road crossing to accommodate vehicular traffic; and
- restore 2.77 acres of tidal wetlands by treating invasive vegetation, expanding the channel cross section to convey low tide flow, grading the wetland floodplain bench, and planting native vegetation.

Alternative 1 yields a total FCU after 50 years of 18.64 (Table 2-67).

Alternative 2 proposes the following:

- restore 3.80 acres of side channel and tidal wetlands by creating a side channel to connect with the Hudson River (which will maintain flow during low tide) and regrading the corridor to establish tidal wetlands;
- create a road crossing to accommodate vehicular traffic; and
- restore 2.77 acres of tidal wetlands by treating invasive vegetation, expanding the channel cross section to convey low tide flow, grading the wetland floodplain bench, and planting native vegetation.

Alternative 2 yields a total FCU after 50 years of 20.42 (Table 2-71).

Table 2-61: Schodack Island South Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	10.96	--	--	12.71
Alternative 1	10.96	13.59	15.39	18.64
Alternative 2	10.96	17.91	20.59	20.42

Table 2-62: Schodack Island South Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Phragmites	Phrag-1	0.35	0.5	0.18	0.8	0.28	0.7	0.25	0.7	0.25	0.4	0.14	1.0	*NA*	1.09
Scrub/Shrub	EM/SS-R-1	0.30	*NA*	*0.00*	1.0	0.30	0.8	0.24	0.9	0.27	0.5	0.15	1.0	*NA*	0.96
Typha angustifolia	EM-R-3	2.13	0.4	0.85	0.5	1.07	0.7	1.49	0.8	1.70	0.3	0.64	1.0	*NA*	5.75
Tidal Mudflat	UV-1	0.77	0.9	0.69	0.8	0.62	0.9	0.69	0.7	0.54	0.4	0.31	1.0	*NA*	2.85
Upper Tidal Wetland	EM-R-1	0.09	0.9	0.08	0.7	0.06	0.7	0.06	0.8	0.07	0.4	0.04	1.0	*NA*	0.32
Upland Road Crossing		0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	3.09	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**10.96**

Table 2-63: Schodack Island South Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	1.08	*NA*	*0.00*	0.1	0.11	0.4	0.43	0.2	0.22	0.2	0.22	1.0	*NA*	0.97
Phragmites	Phrag-1	1.64	0.5	0.82	0.8	1.31	0.7	1.15	0.7	1.15	0.4	0.66	1.0	*NA*	5.08
Upper Tidal Wetland	EM-R-1	1.90	0.9	1.71	0.7	1.33	0.7	1.33	0.8	1.52	0.4	0.76	1.0	*NA*	6.65
Upland Road Crossing		0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	2.11	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**12.71**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-64: Schodack Island South Alternative 1 – TY-0
Existing conditions 2025 (assuming conditions in 2025 are the same as in 2018)

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Phragmites	Phrag-1	0.35	0.5	0.18	0.8	0.28	0.7	0.25	0.7	0.25	0.4	0.14	1.0	*NA*	1.09
Scrub/Shrub	EM/SS-R-1	0.30	*NA*	*0.00*	1.0	0.30	0.8	0.24	0.9	0.27	0.5	0.15	1.0	*NA*	0.96
Typha angustifolia	EM-R-3	2.13	0.4	0.85	0.5	1.07	0.7	1.49	0.8	1.70	0.3	0.64	1.0	*NA*	5.75
Tidal Mudflat	UV-1	0.77	0.9	0.69	0.8	0.62	0.9	0.69	0.7	0.54	0.4	0.31	1.0	*NA*	2.85
Upper Tidal Wetland	EM-R-1	0.09	0.9	0.08	0.7	0.06	0.7	0.06	0.8	0.07	0.4	0.04	1.0	*NA*	0.32
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	3.09	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**10.96**

Table 2-65: Schodack Island South Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Scrub/Shrub	EM/SS-R-1	0.42	*NA*	*0.00*	1.0	0.42	0.8	0.34	0.9	0.38	0.5	0.21	1.0	*NA*	1.34
Typha angustifolia	EM-R-3	0.09	0.4	0.04	0.5	0.05	0.7	0.06	0.8	0.07	0.3	0.03	1.0	*NA*	0.24
Tidal Mudflat	UV-1	1.30	0.9	1.17	0.8	1.04	0.9	1.17	0.7	0.91	0.4	0.52	1.0	*NA*	4.81
Upper Tidal Wetland	**IM-1 (TY-2)	2.57	0.5	1.29	0.6	1.54	0.6	1.54	0.7	1.80	0.4	1.03	1.0	*NA*	7.20
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	2.35	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**13.59**

**EPW Sample Point and FCI from Binnen Kill (TY-2)

Table 2-66: Schodack Island South Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Scrub/Shrub	EM/SS-R-1	0.42	*NA*	*0.00*	1.0	0.42	0.8	0.34	0.9	0.38	0.5	0.21	1.0	*NA*	1.34
Typha angustifolia	EM-R-3	0.09	0.4	0.04	0.5	0.05	0.7	0.06	0.8	0.07	0.3	0.03	1.0	*NA*	0.24
Tidal Mudflat	UV-1	1.30	0.9	1.17	0.8	1.04	0.9	1.17	0.7	0.91	0.4	0.52	1.0	*NA*	4.81
Upper Tidal Wetland	EM-R-1	2.57	0.9	2.31	0.7	1.80	0.7	1.80	0.8	2.06	0.4	1.03	1.0	*NA*	9.00
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	2.35	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**15.39**

Table 2-67: Schodack Island South Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.01	*NA*	*0.00*	0.1	0.00	0.4	0.00	0.2	0.00	0.2	0.00	1.0	*NA*	0.01
Tidal Mudflat	UV-1	1.30	0.9	1.17	0.8	1.04	0.9	1.17	0.7	0.91	0.4	0.52	1.0	*NA*	4.81
Lower Tidal Wetland	EM-R-2	0.27	0.9	0.24	0.6	0.16	0.9	0.24	0.8	0.22	0.4	0.11	1.0	*NA*	0.97
Upper Tidal Wetland	EM-R-1	3.67	0.9	3.30	0.7	2.57	0.7	2.57	0.8	2.94	0.4	1.47	1.0	*NA*	12.85
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	1.48	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**18.64**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-68: Schodack Island South Alternative 2 – TY-0
Existing conditions 2025 (assuming conditions in 2025 are the same as in 2018)

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Phragmites	Phrag-1	0.35	0.5	0.18	0.8	0.28	0.7	0.25	0.7	0.25	0.4	0.14	1.0	*NA*	1.09
Scrub/Shrub	EM/SS-R-1	0.30	*NA*	*0.00*	1.0	0.30	0.8	0.24	0.9	0.27	0.5	0.15	1.0	*NA*	0.96
Typha angustifolia	EM-R-3	2.13	0.4	0.85	0.5	1.07	0.7	1.49	0.8	1.70	0.3	0.64	1.0	*NA*	5.75
Tidal Mudflat	UV-1	0.77	0.9	0.69	0.8	0.62	0.9	0.69	0.7	0.54	0.4	0.31	1.0	*NA*	2.85
Upper Tidal Wetland	EM-R-1	0.09	0.9	0.08	0.7	0.06	0.7	0.06	0.8	0.07	0.4	0.04	1.0	*NA*	0.32
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	UPL-FO-1	3.09	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**10.96**

Table 2-69: Schodack Island South Alternative 2 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.71	*NA*	*0.00*	0.1	0.07	0.4	0.28	0.2	0.14	0.2	0.14	1.0	*NA*	0.64
Scrub/Shrub	EM/SS-R-1	0.02	*NA*	*0.00*	1.0	0.02	0.8	0.02	0.9	0.02	0.5	0.01	1.0	*NA*	0.06
Tidal Mudflat	UV-1	1.76	0.9	1.58	0.8	1.41	0.9	1.58	0.7	1.23	0.4	0.70	1.0	*NA*	6.51
Upper Tidal Wetland	**IM-1 (TY-2)	3.82	0.5	1.91	0.6	2.29	0.6	2.29	0.7	2.67	0.4	1.53	1.0	*NA*	10.70
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	0.42	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**17.91**

** EPW Sample Point and FCI from Henry Hudson Park, **EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-70: Schodack Island South Alternative 2 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.71	*NA*	*0.00*	0.1	0.07	0.4	0.28	0.2	0.14	0.2	0.14	1.0	*NA*	0.64
Scrub/Shrub	EM/SS-R-1	0.02	*NA*	*0.00*	1.0	0.02	0.8	0.02	0.9	0.02	0.5	0.01	1.0	*NA*	0.06
Tidal Mudflat	UV-1	1.76	0.9	1.58	0.8	1.41	0.9	1.58	0.7	1.23	0.4	0.70	1.0	*NA*	6.51
Upper Tidal Wetland	EM-R-1	3.82	0.9	3.44	0.7	2.67	0.7	2.67	0.8	3.06	0.4	1.53	1.0	*NA*	13.37
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	0.42	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**20.59**

* EPW Sample Point and FCI from Henry Hudson Park

Table 2-71: Schodack Island South Alternative 2 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	1.06	*NA*	*0.00*	0.1	0.11	0.4	0.42	0.2	0.21	0.2	0.21	1.0	*NA*	0.95
Tidal Mudflat	UV-1	1.59	0.9	1.43	0.8	1.27	0.9	1.43	0.7	1.11	0.4	0.64	1.0	*NA*	5.88
Lower Tidal Wetland	EM-R-2	1.76	0.9	1.58	0.6	1.06	0.9	1.58	0.8	1.41	0.4	0.70	1.0	*NA*	6.34
Upper Tidal Wetland	EM-R-1	2.07	0.9	1.86	0.7	1.45	0.7	1.45	0.8	1.66	0.4	0.83	1.0	*NA*	7.25
Upland Road Crossing	NA	0.12	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
Upland	NA	0.25	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**6.85**													**20.42**

* EPW Sample Point and FCI from Henry Hudson Park

Schodack Island Pocket Wetland A

Schodack Island Pocket Wetland A comprises approximately 3.62 acres. The existing total FCU for this site after 50 years is 2.64 (Table 2-74). Tables 2-74 through 2-77 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for the alternative.

One improvement scenario was studied for this site. Alternative 1 proposes to restore 3.61 acres of tidal wetlands by treating invasive vegetation and planting native species. It yields a total FCU after 50 years of 12.28 (Table 2-78).

Table 2-72: Schodack Island Pocket Wetland A Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	10.10	--	--	2.64
Alternative 1	10.10	8.96	10.46	12.28

Table 2-73: Schodack Island Pocket Wetland A Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.05	*NA*	*0.00*	0.1	0.01	0.4	0.02	0.2	0.01	0.2	0.01	1.0	*NA*	0.05
Phragmites	Phrag-1	0.06	0.5	0.03	0.8	0.05	0.7	0.04	0.7	0.04	0.4	0.02	1.0	*NA*	0.19
Typha angustifolia	EM-R-3	0.29	0.4	0.12	0.5	0.15	0.7	0.20	0.8	0.23	0.3	0.09	1.0	*NA*	0.78
Upper Tidal Wetland	EM-R-1	1.76	0.9	1.58	0.7	1.23	0.7	1.23	0.8	1.41	0.4	0.70	1.0	*NA*	6.16
Wooded Swamp	FO-R-1	1.22	*NA*	0.00	0.9	1.10	0.7	0.85	0.8	0.98	*NA*	*0.00*	1.0	*NA*	2.93
Upland	UPL-FO-1	0.24	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**3.62**													**10.10**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-74: Schodack Island Pocket Wetland A Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	**Phrag-2	1.00	NA	0.00	0.8	0.80	0.8	0.80	0.7	0.70	NA	0.00	1.0	NA	2.30
Open Water	*OW/Bulkhead	0.48	NA	0.00	0.1	0.05	0.4	0.19	0.2	0.10	NA	0.00	1.0	NA	0.34
	Totals:	**1.48**													**2.64**

** EPW Sample Point and FCI from Henry Hudson Park , ** EPW Sample Point and FCI from Binnen Kill*

Table 2-75: Schodack Island Pocket Wetland A Alternative 1 – TY-0 Existing conditions 2025 (assuming conditions in 2025 are the same as in 2018)

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.05	*NA*	*0.00*	0.1	0.01	0.4	0.02	0.2	0.01	0.2	0.01	1.0	*NA*	0.05
Phragmites	Phrag-1	0.06	0.5	0.03	0.8	0.05	0.7	0.04	0.7	0.04	0.4	0.02	1.0	*NA*	0.19

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Typha angustifolia	EM-R-3	0.29	0.4	0.12	0.5	0.15	0.7	0.20	0.8	0.23	0.3	0.09	1.0	*NA*	0.78
Upper Tidal Wetland	EM-R-1	1.76	0.9	1.58	0.7	1.23	0.7	1.23	0.8	1.41	0.4	0.70	1.0	*NA*	6.16
Wooded Swamp	FO-R-1	1.22	*NA*	*NA*	0.9	1.10	0.7	0.85	0.8	0.98	*NA*	*0.00*	1.0	*NA*	2.93
Upland	UPL-FO-1	0.24	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**3.62**													**10.10**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-76: Schodack Island Pocket Wetland A Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.01	*NA*	*0.00*	0.1	0.00	0.4	0.00	0.2	0.00	0.2	0.00	1.0	*NA*	0.01
Upper Tidal Wetland	**IM-1 (TY-2)	2.15	0.5	1.08	0.6	1.29	0.6	1.29	0.7	1.51	0.4	0.86	1.0	*NA*	6.02
Wooded Swamp	FO-R-1	1.22	*NA*	0.00	0.9	1.10	0.7	0.85	0.8	0.98	*NA*	*0.00*	1.0	*NA*	2.93
Upland	UPL-FO-1	0.24	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**3.62**													**8.96**

** EPW Sample Point and FCI from Henry Hudson Park, **EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-77: Schodack Island Pocket Wetland A Alternative 1 – TY-20 2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.01	*NA*	*0.00*	0.1	0.00	0.4	0.00	0.2	0.00	0.2	0.00	1.0	*NA*	0.01
Upper Tidal Wetland	EM-R-1	2.15	0.9	1.94	0.7	1.51	0.7	1.51	0.8	1.72	0.4	0.86	1.0	*NA*	7.53
Wooded Swamp	FO-R-1	1.22	*NA*	0.00	0.9	1.10	0.7	0.85	0.8	0.98	*NA*	*0.00*	1.0	*NA*	2.93
Upland	UPL-FO-1	0.24	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**3.62**													**10.46**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-78: Schodack Island Pocket Wetland A Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.23	*NA*	*0.00*	0.1	0.02	0.4	0.09	0.2	0.05	0.2	0.05	1.0	*NA*	0.21
Lower Tidal Wetland	EM-R-2	2.11	0.9	1.90	0.6	1.27	0.9	1.90	0.8	1.69	0.4	0.84	1.0	*NA*	7.60
Upper Tidal Wetland	EM-R-1	1.28	0.9	1.15	0.7	0.90	0.7	0.90	0.8	1.02	0.4	0.51	1.0	*NA*	4.48
	Totals:	**3.62**													**12.28**

** EPW Sample Point and FCI from Henry Hudson Park*

Schodack Island Pocket Wetland B

Schodack Island Pocket Wetland B comprises approximately 1.48 acres. The existing total FCU for this site after 50 years is 1.11 (Table 2-81). Tables 2-81 through 2-84 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for the alternative.

One improvement scenario was studied for this site. Alternative 1 proposes to restore 1.48 acres of non-tidal wetlands by treating invasive vegetation and planting native species. It yields a total FCU after 50 years of 3.94 (Table 2-85).

Table 2-79: Schodack Island Pocket Wetland B Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	2.64	--	--	1.11
Alternative 1	2.64	2.94	3.14	3.94

Table 2-80: Schodack Island Pocket Wetland B Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	**Phrag-2	1.00	NA	0.00	0.8	0.80	0.8	0.80	0.7	0.70	NA	0.00	1.0	NA	2.30
Open Water	*OW/Bulkhead	0.48	NA	0.00	0.1	0.05	0.4	0.19	0.2	0.10	NA	0.00	1.0	NA	0.34
	Totals:	**1.48**													**2.64**

* EPW Sample Point and FCI from Henry Hudson Park , ** EPW Sample Point and FCI from Binnen Kill

Table 2-81: Schodack Island Pocket Wetland B Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Phragmites	Phrag-1	1.00	0.6	0.13	1.0	0.21	0.7	0.15	0.6	0.13	0.3	0.06	1.0	NA	0.67
Tidal Open Water	*OW/Bulkhead	0.48	*NA*	*0.00*	0.1	0.05	0.4	0.19	0.2	0.10	0.2	0.10	1.0	NA	0.44
	Totals:	**1.48**													**1.11**

* EPW Sample Point and FCI from Henry Hudson Park

Table 2-82: Schodack Island Pocket Wetland B Alternative 1 – TY-0
Existing conditions 2025 (assuming conditions in 2025 are the same as in 2018)
Please note a freshwater open water data point was not collected

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Freshwater Phragmites	**Phrag-2	1.00	*NA*	*0.00*	0.8	0.80	0.8	0.80	0.7	0.70	*NA*	*0.00*	1.0	*NA*	2.30
Open Water	*OW/Bulkhead	0.48	*NA*	*0.00*	0.1	0.05	0.4	0.19	0.2	0.10	*NA*	*0.00*	1.0	*NA*	0.34
	Totals:	**1.48**													**2.64**

** EPW Sample Point and FCI from Henry Hudson Park , ** EPW Sample Point and FCI from Binnen Kill*

Table 2-83: Schodack Island Pocket Wetland B Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI		FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Shallow Emergent Wetland	*S-EM-1 (TY-2)	1.00	*NA*	*0.00*	0.9	0.90	0.9	0.90	0.8	0.80	*NA*	*0.00*	1.0	*NA*	2.60
Open Water	**OW/Bulkhead	0.48	*NA*	*0.00*	0.1	0.05	0.4	0.19	0.2	0.10	*NA*	*0.00*	1.0	*NA*	0.34
	Totals:	**1.48**													**2.94**

** EPW Sample Point and FCI from Binnen Kill (TY-2), ** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-84: Schodack Island Pocket Wetland B Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Shallow Emergent Wetland	*S-EM-2/S-EM-2	1.00	*NA*	*0.00*	1.0	1.00	1.0	1.00	0.8	0.80	*NA*	*0.00*	1.0	*NA*	2.80
Open Water	**OW/Bulkhead	0.48	*NA*	*0.00*	0.1	0.05	0.4	0.19	0.2	0.10	*NA*	*0.00*	1.0	*NA*	0.34
	Totals:	**1.48**													**3.14**

** EPW Sample Point and FCI from Binnen Kill, ** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-85: Schodack Island Pocket Wetland B Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Upper Tidal Wetland	EM-R-1	1.00	0.9	0.90	0.7	0.70	0.7	0.70	0.8	0.80	0.4	0.40	1.0	*NA*	3.50
Tidal Open Water	*OW/Bulkhead	0.48	*NA*	*0.00*	0.1	0.05	0.4	0.19	0.2	0.10	0.2	0.10	1.0	*NA*	0.44
	Totals:	**1.48**													**3.94**

** EPW Sample Point and FCI from Henry Hudson Park*

Schodack Island Pocket Wetland C

Schodack Island Pocket Wetland C comprises approximately 2.01 acres. The existing total FCU for this site after 50 years is 6.14 (Table 2-88). Tables 2-88 through 2-91 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for the alternative.

One improvement scenario was studied for this site. Alternative 1 proposes to restore 2.01 acres of tidal wetlands by treating invasive vegetation and planting native species. It yields a total FCU after 50 years of 6.99 (Table 2-92).

Table 2-86: Schodack Island Pocket Wetland C Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	5.42	--	--	6.14
Alternative 1	5.42	5.16	5.77	6.99

Table 2-87: Schodack Island Pocket Wetland C Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.02	*NA*	0.00	0.1	0.00	0.4	0.01	0.2	0.00	0.2	0.00	1.0	*NA*	0.02
Phragmites	Phrag-1	0.87	0.5	0.44	0.8	0.70	0.7	0.61	0.7	0.61	0.4	0.35	1.0	*NA*	2.70
Scrub/Shrub	EM/SS-R-1	0.02	*NA*	0.00	1.0	0.02	0.8	0.02	0.9	0.02	0.5	0.01	1.0	*NA*	0.06
Wooded Swamp	FO-R-1	1.10	*NA*	0.00	0.9	0.99	0.7	0.77	0.8	0.88	*NA*	*0.00*	1.0	*NA*	2.64
	Totals:	**2.01**													**5.42**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-88: Schodack Island Pocket Wetland C Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.04	*NA*	0.00	0.1	0.00	0.4	0.01	0.2	0.01	0.2	0.01	1.0	*NA*	0.03
Phragmites	Phrag-1	1.97	0.5	0.99	0.8	1.58	0.7	1.38	0.7	1.38	0.4	0.79	1.0	*NA*	6.11
	Totals:	**2.01**													**6.14**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-89: Schodack Island Pocket Wetland C Alternative 1 – TY-0 Existing conditions 2025 (assuming conditions in 2025 are the same as in 2018)

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.02	*NA*	0.00	0.1	0.00	0.4	0.01	0.2	0.00	0.2	0.00	1.0	*NA*	0.02

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Phragmites	Phrag-1	0.87	0.5	0.44	0.8	0.70	0.7	0.61	0.7	0.61	0.4	0.35	1.0	*NA*	2.70
Scrub/Shrub	EM/SS-R-1	0.02	*NA*	0.00	1.0	0.02	0.8	0.02	0.9	0.02	0.5	0.01	1.0	*NA*	0.06
Wooded Swamp	FO-R-1	1.10	*NA*	0.00	0.9	0.99	0.7	0.77	0.8	0.88	*NA*	*0.00*	1.0	*NA*	2.64
	Totals:	**2.01**													**5.42**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-90: Schodack Island Pocket Wetland C Alternative 1 – TY-2 2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.02	*NA*	0.00	0.1	0.00	0.4	0.01	0.2	0.00	0.2	0.00	1.0	*NA*	0.02
Upper Tidal Wetland	**IM-1 (TY-2)	0.87	0.5	0.44	0.6	0.52	0.6	0.52	0.7	0.61	0.4	0.35	1.0	*NA*	2.44

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Scrub/Shrub	EM/SS-R-1	0.02	*NA*	0.00	1.0	0.02	0.8	0.02	0.9	0.02	0.5	0.01	1.0	*NA*	0.06
Wooded Swamp	FO-R-1	1.10	*NA*	0.00	0.9	0.99	0.7	0.77	0.8	0.88	*NA*	*0.00*	1.0	*NA*	2.64
	Totals:	**2.01**													**5.16**

** EPW Sample Point and FCI from Henry Hudson Park, **EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-91: Schodack Island Pocket Wetland C Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.02	*NA*	0.00	0.1	0.00	0.4	0.01	0.2	0.00	0.2	0.00	1.0	*NA*	0.02
Upper Tidal Wetland	EM-R-1	0.87	0.9	0.78	0.7	0.61	0.7	0.61	0.8	0.70	0.4	0.35	1.0	*NA*	3.05
Scrub/Shrub	EM/SS-R-1	0.02	*NA*	0.00	1.0	0.02	0.8	0.02	0.9	0.02	0.5	0.01	1.0	*NA*	0.06
Wooded Swamp	FO-R-1	1.10	*NA*	0.00	0.9	0.99	0.7	0.77	0.8	0.88	*NA*	*0.00*	1.0	*NA*	2.64
	Totals:	**2.01**													**5.77**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-92: Schodack Island Pocket Wetland C Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.05	*NA*	0.00	0.1	0.01	0.4	0.02	0.2	0.01	0.2	0.01	1.0	*NA*	0.05
Lower Tidal Wetland	EM-R-2	0.87	0.9	0.78	0.6	0.52	0.9	0.78	0.8	0.70	0.4	0.35	1.0	*NA*	3.13
Upper Tidal Wetland	EM-R-1	1.09	0.9	0.98	0.7	0.76	0.7	0.76	0.8	0.87	0.4	0.44	1.0	*NA*	3.82
	Totals:	**2.01**													**6.99**

** EPW Sample Point and FCI from Henry Hudson Park*

Schodack Island Pocket Wetland D

Schodack Island Pocket Wetland D comprises approximately 3.84 acres. The existing total FCU for this site after 50 years is 3.27 (Table 2-95). Tables 2-95 through 2-98 presents the total FCUs for existing (TY0), following construction (TY2), 20 (TY20) and 50 (TY50) years following construction for the alternative.

One improvement scenario was studied for this site. Alternative 1 proposes to restore 3.85 acres of tidal wetlands by grading (to allow tidal flushing) and planting native vegetation. It yields a total FCU after 50 years of 12.84 (Table 2-96).

Table 2-93: Schodack Island Pocket Wetland D Results Summary

Alternative	TY-0	TY-2	TY-20	TY-50
Existing	3.32	--	--	3.27
Alternative 1	3.32	10.30	12.28	12.84

Table 2-94: Schodack Island Pocket Wetland D Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.03	*NA*	*0.00*	0.1	0.00	0.4	0.01	0.2	0.01	0.2	0.01	1.0	*NA*	0.03
Upper Tidal Wetland	EM-R-1	0.27	0.9	0.24	0.7	0.19	0.7	0.19	0.8	0.22	0.4	0.11	1.0	*NA*	0.95
Wooded Swamp	FO-R-1	0.98	*NA*	0.00	0.9	0.88	0.7	0.69	0.8	0.78	*NA*	*0.00*	1.0	*NA*	2.35
Upland	UPL-FO-1	2.56	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**3.84**													**3.32**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-95: Schodack Island Pocket Wetland D Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.16	*NA*	*0.00*	0.1	0.02	0.4	0.06	0.2	0.03	0.2	0.03	1.0	*NA*	0.14
Tidal Mudflat	UV-1	0.17	0.9	0.15	0.8	0.14	0.9	0.15	0.7	0.12	0.4	0.07	1.0	*NA*	0.63
Upper Tidal Wetland	EM-R-1	0.04	0.9	0.04	0.7	0.03	0.7	0.03	0.8	0.03	0.4	0.02	1.0	*NA*	0.14
Wooded Swamp	FO-R-1	0.98	*NA*	0.00	0.9	0.88	0.7	0.69	0.8	0.78	*NA*	*0.00*	1.0	*NA*	2.35
Upland	UPL-FO-1	2.49	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**3.84**													**3.27**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-96: Schodack Island Pocket Wetland D Alternative 1 – TY-0
Existing conditions 2025 (assuming conditions in 2025 are the same as in 2018)

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.03	*NA*	*0.00*	0.1	0.00	0.4	0.01	0.2	0.01	0.2	0.01	1.0	*NA*	0.03
Upper Tidal Wetland	EM-R-1	0.27	0.9	0.24	0.7	0.19	0.7	0.19	0.8	0.22	0.4	0.11	1.0	*NA*	0.95
Wooded Swamp	FO-R-1	0.98	*NA*	0.00	0.9	0.88	0.7	0.69	0.8	0.78	*NA*	*0.00*	1.0	*NA*	2.35
Upland	UPL-FO-1	2.56	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	NA
	Totals:	**3.84**													**3.32**

* EPW Sample Point and FCI from Henry Hudson Park

Table 2-97: Schodack Island Pocket Wetland D Alternative 1 – TY-2
2027 post construction; one growing season; incorporates 2027 sea levels

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.03	*NA*	*0.00*	0.1	0.00	0.4	0.01	0.2	0.01	0.2	0.01	1.0	*NA*	0.03
Upper Tidal Wetland	**IM-1 (TY-2)	2.83	0.5	1.42	0.6	1.70	0.6	1.70	0.7	1.98	0.4	1.13	1.0	*NA*	7.92
Wooded Swamp	FO-R-1	0.98	*NA*	0.00	0.9	0.88	0.7	0.69	0.8	0.78	*NA*	*0.00*	1.0	*NA*	2.35
	Totals:	**3.84**													**10.30**

** EPW Sample Point and FCI from Henry Hudson Park, **EPW Sample Point and FCI from Binnen Kill (TY-2)*

Table 2-98: Schodack Island Pocket Wetland D Alternative 1 – TY-20
2045 post construction; approximately 20 years of growth

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.03	*NA*	*0.00*	0.1	0.00	0.4	0.01	0.2	0.01	0.2	0.01	1.0	*NA*	0.03
Upper Tidal Wetland	EM-R-1	2.83	0.9	2.55	0.7	1.98	0.7	1.98	0.8	2.26	0.4	1.13	1.0	*NA*	9.91
Wooded Swamp	FO-R-1	0.98	*NA*	0.00	0.9	0.88	0.7	0.69	0.8	0.78	*NA*	*0.00*	1.0	*NA*	2.35
	Totals:	**3.84**													**12.28**

** EPW Sample Point and FCI from Henry Hudson Park*

Table 2-99: Schodack Island Pocket Wetland D Alternative 1 – TY-50
2075 post construction; approximately 50 years of growth; incorporates sea level change

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	0.33	*NA*	*0.00*	0.1	0.03	0.4	0.13	0.2	0.07	0.2	0.07	1.0	*NA*	0.30
Lower Tidal Wetland	EM-R-2	2.53	0.9	2.28	0.6	1.52	0.9	2.28	0.8	2.02	0.4	1.01	1.0	*NA*	9.11
Upper Tidal Wetland	EM-R-1	0.98	0.9	0.88	0.7	0.69	0.7	0.69	0.8	0.78	0.4	0.39	1.0	*NA*	3.43
	Totals:	**3.84**													**12.84**

** EPW Sample Point and FCI from Henry Hudson Park*

2.4 Functional Capacity Unit Results for Recommended Plan

This section presents the updated ecological benefits for the optimized recommended plan alternative for Henry Hudson Park and Schodack Island Park summarizing the acreages, FCIs and FCUs of the existing wetlands (WAA) and projected site conditions in 50 years. The acreage was projected using the Relative Sea Level Change Anlalysis (Appendix B) for the Future Without Project Considitions and future benefits calculations for years 2, 20 and 50. Habitat acreage was projected 50 years beyond the design year (based on the annual elevation datum) for the intermediate sea level change scenario. However, Schodack Island Park was predicted 55 years beyond the design year due to delayed construction implementation. EPW for the updated benefits calculation is based on the following:

- Henry Hudson Park- TY 0 and existing wetlands is 2027 and the projected site conditions over 50 years to 2077;
- Scodack Island Park- TY 0 and existing wetlands is 2031 and the projected site conditions over 50 years to 2081.

Henry Hudson Park

Henry Hudson Park Alternative 1 was selected as the Recommended Plan. The alternative was optimized, and as part of the optimization process, the project footprint decreased from 5.65 acres to 5.46 acres. Tables 2-99 through 2-104 presents the total FCUs for TY0, TY2,TY20, and TY50.

The Recommended Plan proposes the following:

- Restore 3.59 acres of tidal wetlands in the western portion of the site by excavating soils to achieve tidal wetland hydrology, installing shoreline bank stabilization boulders, and planting native vegetation;
- Restore 0.60 acres of shoreline wetland by establishing vegetated riprap along existing timber cribbing, replacing concrete caps with riprap and conducting minor grading, filling the void spaces with soil, and planting native vegetation; and
- Restore 0.15 acres of tidal wetlands in the cove at the south end of the site by stabilizing the existing scour, installing coir log toe protection, and planting native vegetation.

The Recommended Plan yields a total FCU after 50 years of 13.35 (Table 2-105).

Table 2-100: Henry Hudson Park Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.40	*NA*	0.00	0.10	0.04	0.40	0.16	0.20	0.08	0.20	0.08	1.00	*NA*	0.36
Tidal Mudflat	Mud Flat-1	0.15	0.30	0.05	0.30	0.05	0.70	0.11	0.70	0.11	0.40	0.06	1.00	*NA*	0.36
Upland	*NA*	4.91	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.46**													**0.72**

Table 2-101: Henry Hudson Park Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.54	*NA*	0.00	0.10	0.05	0.40	0.21	0.20	0.11	0.20	0.11	1.00	*NA*	0.48
Tidal Mudflat	Mud Flat-1	0.28	0.30	0.08	0.30	0.08	0.70	0.20	0.70	0.20	0.40	0.11	1.00	*NA*	0.67
Upland	*NA*	4.65	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.46**													**1.15**

Table 2-102: Henry Hudson Park Recommended Plan – TY-0
Existing Conditions 2025, assuming existing conditions in 2025 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water (Remnant Bulkhead)	OW/Bulkhead	0.40	*NA*	0.00	0.10	0.04	0.40	0.16	0.20	0.08	0.20	0.08	1.00	*NA*	0.36
Tidal Mudflat	Mud Flat-1	0.15	0.30	0.05	0.30	0.05	0.70	0.11	0.70	0.11	0.40	0.06	1.00	*NA*	0.36
Upland	*NA*	4.91	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.46**													**0.72**

Table 2-103: Henry Hudson Park Recommended Plan – TY-2
2027 post construction; one growing season

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	*LIM-1	0.39	0.90	0.35	0.90	0.35	0.90	0.35	0.90	0.35	0.90	0.35	1.00	*NA*	1.76
Upper Tidal Wetland	*IM-1 (TY-2)	3.94	0.50	1.97	0.60	2.36	0.60	2.36	0.70	2.76	0.40	1.58	1.00	*NA*	11.03
**Upland	*NA*	1.13	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.46**													**12.79**

* EPW Sample Point and FCI from Binnen Kill
** Placed rock, such as boulder stabilization, was coded as 'Upland'

Table 2-104: Henry Hudson Park Recommended Plan – TY-20
2045 post construction; 19 years of growth; incorporates sea level change and accretion

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	*LIM-1	0.40	0.90	0.36	0.90	0.36	0.90	0.36	0.90	0.36	0.90	0.36	1.00	*NA*	1.79
Upper Tidal Wetland	*IM-1	3.95	0.50	1.97	0.70	2.76	0.60	2.37	0.70	2.76	0.40	1.58	1.00	*NA*	11.45
**Upland	*NA*	1.11	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.46**													**13.25**

* EPW Sample Point and FCI from Binnen Kill
** Placed rock, such as boulder stabilization, was coded as 'Upland'

Table 2-105: Henry Hudson Park Recommended Plan – TY-50
2075 post construction; 49 years of growth; incorporates sea level change and accretion

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	*LIM-1	0.43	0.90	0.39	0.90	0.39	0.90	0.39	0.90	0.39	0.90	0.39	1.00	*NA*	1.94
Upper Tidal Wetland	*IM-1	3.93	0.50	1.97	0.70	2.75	0.60	2.36	0.70	2.75	0.40	1.57	1.00	*NA*	11.41
**Upland	*NA*	1.10	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	Totals:	**5.46**													**13.35**

* EPW Sample Point and FCI from Binnen Kill
** Placed rock, such as boulder stabilization, was coded as 'Upland'

Schodack Island North

Schodack Island North Alternative 2 was selected as the Recommended Plan. The alternative was optimized, and as part of the optimization process, the project footprint increased from 30.88 acres to 32.12 acres. Tables 2-105 through 2-110 presents the total FCUs for TY0, TY2, TY20, and TY50.

- Restore 2.82 acres of tidal wetlands at the northern end of the site by treating invasive vegetation and planting native species;
- Restore 0.84 acres of tidal wetlands and side channel connection by treating invasive vegetation, converting wetlands to a side channel connection point with fringe tidal wetlands, and stabilizing the shoreline as necessary for side channel connection;
- Create a road crossing to accommodate vehicular traffic and redirecting a ski trail to the existing road;
- Restore 7.64 acres of side channel and tidal wetland corridor by excavating a side channel to connect with the Hudson River and regrading the corridor to establish tidal wetlands; and
- Restore 16.23 acres of tidal wetlands at the southern end of the site by treating invasive vegetation, expanding the channel cross section to convey low tide flow, grading the wetland floodplain bench, and planting native vegetation.

The Recommended Plan yields a total FCU after 50 years of 96.06 (Table 2-111).

Table 2-106: Schodack Island North Existing Condition – TY-0

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	0.77	0.90	0.69	0.60	0.46	0.90	0.69	0.80	0.62	0.40	0.31	1.00	*NA*	2.77
Tidal Open Water	*OW/Bulkhead	1.09	*NA*	0.00	0.10	0.11	0.40	0.43	0.20	0.22	0.20	0.22	1.00	*NA*	0.98
Phragmites	Phrag-1	5.57	0.50	2.78	0.80	4.45	0.70	3.90	0.70	3.90	0.40	2.23	1.00	*NA*	17.25
Scrub/Shrub	EM/SS-R-1	0.29	*NA*	0.00	1.00	0.29	0.80	0.23	0.90	0.26	0.50	0.14	1.00	*NA*	0.92
Typha angustifolia	EM-R-3	9.78	0.40	3.91	0.50	4.89	0.70	6.84	0.80	7.82	0.30	2.93	1.00	*NA*	26.40
Tidal Mudflat	UV-1	0.67	0.90	0.60	0.80	0.53	0.90	0.60	0.70	0.47	0.40	0.27	1.00	*NA*	2.47
Upper Tidal Wetland	EM-R-1	1.02	0.90	0.92	0.70	0.71	0.70	0.71	0.80	0.82	0.40	0.41	1.00	*NA*	3.57
Upland Road Crossing	*NA*	0.60	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	0.00
Upland	UPL-FO-1	12.35	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	0.00
	Totals:	**32.12**													**54.37**

* EPW Sample Point and FCI from Henry Hudson Park

Table 2-107: Schodack Island North Existing Condition – TY-50

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Tidal Open Water	*OW/Bulkhead	3.24	*NA*	0.00	0.10	0.32	0.40	1.30	0.20	0.65	0.20	0.65	1.00	*NA*	2.92
Phragmites	Phrag-1	7.43	0.50	3.72	0.80	5.95	0.70	5.20	0.70	5.20	0.40	2.97	1.00	*NA*	23.04
Upper Tidal Wetland	EM-R-1	10.20	0.90	9.18	0.70	7.14	0.70	7.14	0.80	8.16	0.40	4.08	1.00	*NA*	35.70
Upland Road Crossing	*NA*	0.60	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	*NA*	0.00
Upland	UPL-FO-1	10.65	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	*NA*	0.00
	Totals:	**32.12**													**61.66**

* EPW Sample Point and FCI from Henry Hudson Park

Table 2-108: Schodack Island North Recommended Plan – TY-0
Existing Conditions 2031, assuming existing conditions in 2031 are the same as 2018

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	0.77	0.90	0.69	0.60	0.46	0.90	0.69	0.80	0.62	0.40	0.31	1.00	*NA*	2.77
Tidal Open Water	*OW/Bulkhead	1.09	*NA*	0.00	0.10	0.11	0.40	0.43	0.20	0.22	0.20	0.22	1.00	*NA*	0.98
Phragmites	Phrag-1	5.57	0.50	2.78	0.80	4.45	0.70	3.90	0.70	3.90	0.40	2.23	1.00	*NA*	17.25
Scrub/Shrub	EM/SS-R-1	0.29	*NA*	0.00	1.00	0.29	0.80	0.23	0.90	0.26	0.50	0.14	1.00	*NA*	0.92
Typha angustifolia	EM-R-3	9.78	0.40	3.91	0.50	4.89	0.70	6.84	0.80	7.82	0.30	2.93	1.00	*NA*	26.40
Tidal Mudflat	UV-1	0.67	0.90	0.60	0.80	0.53	0.90	0.60	0.70	0.47	0.40	0.27	1.00	*NA*	2.47
Upper Tidal Wetland	EM-R-1	1.02	0.90	0.92	0.70	0.71	0.70	0.71	0.80	0.82	0.40	0.41	1.00	*NA*	3.57
Upland Road Crossing	*NA*	0.60	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	0.00
Upland	UPL-FO-1	12.35	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	0.00
	Totals:	**32.12**													**54.37**

* EPW Sample Point and FCI from Henry Hudson Park

Table 2-109: Schodack Island North Recommended Plan – TY-2
2033 post construction

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	2.48	0.90	2.23	0.60	1.49	0.90	2.23	0.80	1.98	0.40	0.99	1.00	*NA*	8.92
Tidal Open Water	*OW/Bulkhead	0.61	*NA*	0.00	0.10	0.06	0.40	0.24	0.20	0.12	0.20	0.12	1.00	*NA*	0.55
Scrub/Shrub	EM/SS-R-1	15.92	*NA*	0.00	1.00	15.92	0.80	12.74	0.90	14.33	0.50	7.96	1.00	*NA*	50.95
Upper Tidal Wetland	**IM-1 (TY-2)	9.21	0.50	4.61	0.60	5.53	0.60	5.53	0.70	6.45	0.40	3.69	1.00	*NA*	25.80
Upland Road Crossing	*NA*	0.19	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	0.00
^Upland	UPL-FO-1	3.71	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	0.00
	Totals:	**32.12**													**86.22**

* EPW Sample Point and FCI from Henry Hudson Park, **EPW Sample Point and FCI from Binnen Kill (TY-2)
^Placed rock, such as boulder stabilization, was coded as 'Upland'

Table 2-110: Schodack Island North Recommended Plan – TY-20
2051 post construction; 18 years of growth; incorporates sea level change and accretion

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	2.59	0.90	2.33	0.60	1.55	0.90	2.33	0.80	2.07	0.40	1.04	1.00	*NA*	9.32
Tidal Open Water	*OW/Bulkhead	0.65	*NA*	0.00	0.10	0.07	0.40	0.26	0.20	0.13	0.20	0.13	1.00	*NA*	0.59
Scrub/Shrub	EM/SS-R-1	9.86	*NA*	0.00	1.00	9.86	0.80	7.89	0.90	8.87	0.50	4.93	1.00	*NA*	31.55
Upper Tidal Wetland	EM-R-1	15.28	0.90	13.75	0.70	10.70	0.70	10.70	0.80	12.23	0.40	6.11	1.00	*NA*	53.48
Upland Road Crossing	*NA*	0.19	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	*NA*	0.00
**Upland	UPL-FO-1	3.55	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	*NA*	0.00
	Totals:	**32.12**													**94.94**

* EPW Sample Point and FCI from Henry Hudson Park
** Placed rock, such as boulder stabilization, was coded as 'Upland'

Table 2-111: Schodack Island North Recommended Plan – TY-50
2081 post construction; 48 years of growth; incorporates sea level change and accretion

Wetland Type/Name	EPW-Sample Point ID	AREA (Ac.)	Function												Cumulative FCU
			Shoreline Bank Erosion Control		Sediment Stabilization		Water Quality		Wildlife		Fish - Tidal		Uniqueness - Heritage		
			FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	FCI	FCU	
Lower Tidal Wetland	EM-R-2	2.77	0.90	2.49	0.60	1.66	0.90	2.49	0.80	2.22	0.40	1.11	1.00	*NA*	9.97
Tidal Open Water	*OW/Bulkhead	0.72	*NA*	0.00	0.10	0.07	0.40	0.29	0.20	0.14	0.20	0.14	1.00	*NA*	0.65
Scrub/Shrub	EM/SS-R-1	7.71	*NA*	0.00	1.00	7.71	0.80	6.17	0.90	6.94	0.50	3.86	1.00	*NA*	24.68
Upper Tidal Wetland	EM-R-1	17.36	0.90	15.62	0.70	12.15	0.70	12.15	0.80	13.89	0.40	6.94	1.00	*NA*	60.76
Upland Road Crossing	*NA*	0.19	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	*NA*	0.00
**Upland	UPL-FO-1	3.37	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	0.00	*NA*	*NA*	0.00
	Totals:	**32.12**													**96.06**

* EPW Sample Point and FCI from Henry Hudson Park
** Placed rock, such as boulder stabilization, was coded as 'Upland'

3.0 Watershed-Scale Upstream Connectivity Toolkit

Tributary connectivity projects are designed around enhancing aquatic organism passage at four sites in the basin, which have the potential to enhance migratory connectivity for a broad assemblage of taxa utilizing the Hudson River. Benefits are quantified using the Watershed-Scale Upstream Connectivity Toolkit (WUCT), which was certified for USACE use in Fall 2018. Model documentation provides a thorough overview of the technical details of the model. Briefly, the model provides a procedure for quantifying benefits associated with removal of organism movement barriers within a watershed (e.g., dam removal, culvert repair, fish ladder installation) or impacts of barrier addition (e.g., dam construction, weir installation). The model focuses on upstream movement of migratory organisms such as fish and is intended for application at the watershed-scale. The algorithm is based on four primary components: habitat quantity upstream of a dam, habitat quality upstream of a dam, the passability of a structure for a given organism, and the shape/topology of the watershed. This algorithm combines these data to estimate quality-weighted, accessible habitat at the watershed scale. The model is executed in the R Statistical Software Language.

Application of the WUCT in the Hudson River quantifies connectivity benefits associated with four locations: one on Rondout Creek and three on Moodna Creek. Fish passage outputs are quantified in terms of "accessible habitat" using the WUCT with river herring and American eel as focal taxa. Field investigations were conducted in July 2018 at four barriers to aquatic organism passage. A brief history of each structure was summarized, and notable field constraints and opportunities were identified. For each barrier, a minimum of three alternatives was developed, considering options such as: the future without project (FWOP), complete barrier removal, partial barrier removal, barrier modification (e.g., lowering, notching), and a variety of fishways (e.g., technical passes, nature-like bypasses). Table 1 provides a brief review of key features of the structures and the upstream habitat (assessment described below).

The WUCT requires three general types of inputs, and the HRHR parameterization is as follows (parameter quantities shown in Table 3-1 below):

- Habitat Quantity: For each barrier, an area of upstream habitat opened is used as the primary basis for habitat quantity. First, the length of upstream habitat was computed (i.e., the distance between the dam and the next upstream barrier) and included only the mainstem of each river that would be newly accessible. River width was estimated from aerial photos as the average of a minimum of 5 estimates of width. To create an area-based metric, the length of river is multiplied by width. Assessments were conducted in Google Earth and stored as *.kmz files.
- Habitat Quality: Habitat quality was assessed relative to upstream watershed condition. All analyses were conducted using Colorado State's eRAMS modeling

platform for rapid watershed assessment[1]. The drainage area of each barrier was delineated using built-in capabilities (Tools Icon -> Hydrology -> Watershed Delineation) and default digital elevation models. Shape files of the delineated watersheds were downloaded for future use. The Watershed Rapid Assessment Program (WRAP) was then applied to each shape file to generate a rapid estimate of land cover. Natural land cover was computed as the aggregation of four land use categories from the 2011 National Land Cover Dataset (NLCD): open water, forests, grasslands, and wetlands. The average percent national land cover is used as a surrogate for watershed habitat quality.

- Passability: Local studies of fish passage rates (i.e., passability) are unavailable in the focal watersheds. As such, passability was estimated based on prior research studies elsewhere in the region (Franklin et al. 2012), meta-analyses of fishway efficacy across multiple taxa (Noonan et al. 2011, Bunt et al. 2012), and professional judgment. Baseline passability values for river herring were taken from Noonan et al.'s values for Clupeidae (the family containing shad/herring) and adjusted up or down based on field conditions and relative comparisons between sites and alternatives. Passability values for American eel were adjusted from river herring estimates based on qualitative difference in movement physiology and behavior (e.g., side channel environments with lower velocities). All passability values were rounded to the nearest tenth (e.g., 0.2, 0.7) to maintain one significant figure and avoid false precision.

All permutations of restoration actions were assessed across all sites, and connectivity benefits for each taxa and watershed-scale restoration plan were computed. The outputs are summarized in Table 3-2. Connectivity values represent a connectivity- and quality-weighted assessment of total habitat at the watershed scale averaged for both river herring and American eel.

The Recommended Plan included the removal of barriers at Moodna Creek. The optimized plans did not change the benefits and updating ecological benefits was not necessary.

[1] https://erams.com/documentation/wrap/

Table 3-1. Aquatic Organism Passage Background information

	Rondout	**Moodna AOP1**	**Moodna AOP2**	**Moodna AOP3**
Structure Name	Eddyville Dam	Utility Crossing	Firth Cliff Dam	Orr's Mill Dam
Latitude	41.892071	41.454711	41.44184	41.433063
Longitude	-74.021832	-74.04191	-74.052672	-74.054607
State ID	193-0812	NA	195-0501	195-0494
Federal ID	NY01136	NA	NY14793	NY13204
Dam Length (ft)	220	53	162	180
Dam Height (ft)	12	2	9	10
Reservoir Surface Area (ac)	15	NA	3	2
Reservoir Length (ft)	12,009	31.8	1,160	579
Reservoir Width (ft)	2,856	60	81	2,247
Reach Length (ft)	36,655	6,381	2,609	30,500
Reach Width (ft)	148	44	41	66
Drainage Area (mi2)	1,188	168	161	158
Natural Land Cover (%)	69.8	62.8	63.4	63.5
Habitat Quantity (ac)	203.6	6.4	4.6	76.2
Habitat Quality (0 to 1)	0.698	0.628	0.634	0.635
Maximum Habitat Units (HUs)	142.1	4.0	2.9	48.4

Table 3-2. Input data for WUCT application in the HRHR Study
Each node specifies the existing condition (shown as Alt=0), and multiple restoration alternatives are also specified for each node (shown as Alt>0). A dummy node is shown on the Hudson as the source for migratory movement.

Barrier	Alternative	Herring Passage Rate (0 to 1)	Eel Passage Rate (0 to 1)	Upstream Habitat Quantity (ac)	Upstream Habitat Quality (0 to 1)
Hudson	FWOP	1.0	1.0	0.0	1.00
Rondout	FWOP	0.0	0.2	206.3	0.70
Rondout	Alt1	0.2	0.1	206.3	0.70
Rondout	Alt2	1.0	1.0	206.3	0.70
Rondout	Alt3	0.8	0.4	206.3	0.70
Moodna1	FWOP	0.2	0.4	6.4	0.63
Moodna1	Alt1	0.9	1.0	6.4	0.63
Moodna1	Alt2	0.7	0.9	6.4	0.63
Moodna2	FWOP	0.0	0.1	4.6	0.63
Moodna2	Alt1	1.0	1.0	4.6	0.63
Moodna2	Alt2	0.2	0.1	4.6	0.63
Moodna3	FWOP	0.0	0.1	76.2	0.64
Moodna3	Alt1	0.9	1.0	76.2	0.64
Moodna3	Alt2	0.9	1.0	76.2	0.64

Table 3-3. Alternatives analysis using the WUCT in the HRHR Study Competing restoration alternatives are shown as rows, and the alternative used in the plan is denoted by the number shown.

Plan	Rondout	Moodna1	Moodna2	Moodna3	Benefits Herring (HU)	Benefits Eel (HU)
1	FWOP	FWOP	FWOP	FWOP	0.8	30.8
2	Alt1	FWOP	FWOP	FWOP	29.7	16.4
3	Alt2	FWOP	FWOP	FWOP	145.2	146.3
4	Alt3	FWOP	FWOP	FWOP	116.3	59.7
5	FWOP	Alt1	FWOP	FWOP	3.6	33.7
6	Alt1	Alt1	FWOP	FWOP	32.5	19.3
7	Alt2	Alt1	FWOP	FWOP	148.0	149.2
8	Alt3	Alt1	FWOP	FWOP	119.2	62.6
9	FWOP	Alt2	FWOP	FWOP	2.8	33.2
10	Alt1	Alt2	FWOP	FWOP	31.7	18.8
11	Alt2	Alt2	FWOP	FWOP	147.2	148.7
12	Alt3	Alt2	FWOP	FWOP	118.4	62.1
13	FWOP	FWOP	Alt1	FWOP	1.4	33.6
14	Alt1	FWOP	Alt1	FWOP	30.3	19.2
15	Alt2	FWOP	Alt1	FWOP	145.8	149.1
16	Alt3	FWOP	Alt1	FWOP	116.9	62.5
17	FWOP	Alt1	Alt1	FWOP	6.2	40.7
18	Alt1	Alt1	Alt1	FWOP	35.1	26.2
19	Alt2	Alt1	Alt1	FWOP	150.6	156.2
20	Alt3	Alt1	Alt1	FWOP	121.8	69.6

Table 3-3 (cont). Alternatives analysis using the WUCT in the HRHR Study Competing restoration alternatives are shown as rows, and the alternative used in the plan is denoted by the number shown.

Plan	Rondout	Moodna1	Moodna2	Moodna3	Benefits Herring (HU)	Benefits Eel (HU)
21	FWOP	Alt2	Alt1	FWOP	4.9	39.5
22	Alt1	Alt2	Alt1	FWOP	33.7	25.1
23	Alt2	Alt2	Alt1	FWOP	149.3	155.0
24	Alt3	Alt2	Alt1	FWOP	120.4	68.4
25	FWOP	FWOP	Alt2	FWOP	0.9	30.8
26	Alt1	FWOP	Alt2	FWOP	29.8	16.4
27	Alt2	FWOP	Alt2	FWOP	145.3	146.3
28	Alt3	FWOP	Alt2	FWOP	116.5	59.7
29	FWOP	Alt1	Alt2	FWOP	4.2	33.7
30	Alt1	Alt1	Alt2	FWOP	33.0	19.3
31	Alt2	Alt1	Alt2	FWOP	148.6	149.2
32	Alt3	Alt1	Alt2	FWOP	119.7	62.6
33	FWOP	Alt2	Alt2	FWOP	3.2	33.2
34	Alt1	Alt2	Alt2	FWOP	32.1	18.8
35	Alt2	Alt2	Alt2	FWOP	147.6	148.7
36	Alt3	Alt2	Alt2	FWOP	118.8	62.1
37	FWOP	FWOP	FWOP	Alt1	0.8	32.6
38	Alt1	FWOP	FWOP	Alt1	29.7	18.1
39	Alt2	FWOP	FWOP	Alt1	145.2	148.1
40	Alt3	FWOP	FWOP	Alt1	116.3	61.4

Table 3-3 (cont). Alternatives analysis using the WUCT in the HRHR Study Competing restoration alternatives are shown as rows, and the alternative used in the plan is denoted by the number shown.

Plan	Rondout	Moodna1	Moodna2	Moodna3	Benefits Herring (HU)	Benefits Eel (HU)
41	FWOP	Alt1	FWOP	Alt1	3.6	38.1
42	Alt1	Alt1	FWOP	Alt1	32.5	23.6
43	Alt2	Alt1	FWOP	Alt1	148.0	153.6
44	Alt3	Alt1	FWOP	Alt1	119.2	67.0
45	FWOP	Alt2	FWOP	Alt1	2.8	37.2
46	Alt1	Alt2	FWOP	Alt1	31.7	22.7
47	Alt2	Alt2	FWOP	Alt1	147.2	152.7
48	Alt3	Alt2	FWOP	Alt1	118.4	66.0
49	FWOP	FWOP	Alt1	Alt1	10.2	51.2
50	Alt1	FWOP	Alt1	Alt1	39.0	36.7
51	Alt2	FWOP	Alt1	Alt1	154.6	166.7
52	Alt3	FWOP	Alt1	Alt1	125.7	80.0
53	FWOP	Alt1	Alt1	Alt1	45.7	84.6
54	Alt1	Alt1	Alt1	Alt1	74.6	70.1
55	Alt2	Alt1	Alt1	Alt1	190.1	200.1
56	Alt3	Alt1	Alt1	Alt1	161.3	113.5
57	FWOP	Alt2	Alt1	Alt1	35.6	79.0
58	Alt1	Alt2	Alt1	Alt1	64.5	64.6
59	Alt2	Alt2	Alt1	Alt1	180.0	194.5
60	Alt3	Alt2	Alt1	Alt1	151.1	107.9

Table 3-3 (cont). Alternatives analysis using the WUCT in the HRHR Study Competing restoration alternatives are shown as rows, and the alternative used in the plan is denoted by the number shown.

Plan	Rondout	Moodna1	Moodna2	Moodna3	Benefits Herring (HU)	Benefits Eel (HU)
61	FWOP	FWOP	Alt2	Alt1	2.7	32.6
62	Alt1	FWOP	Alt2	Alt1	31.6	18.1
63	Alt2	FWOP	Alt2	Alt1	147.1	148.1
64	Alt3	FWOP	Alt2	Alt1	118.2	61.4
65	FWOP	Alt1	Alt2	Alt1	12.1	38.1
66	Alt1	Alt1	Alt2	Alt1	40.9	23.6
67	Alt2	Alt1	Alt2	Alt1	156.5	153.6
68	Alt3	Alt1	Alt2	Alt1	127.6	67.0
69	FWOP	Alt2	Alt2	Alt1	9.4	37.2
70	Alt1	Alt2	Alt2	Alt1	38.3	22.7
71	Alt2	Alt2	Alt2	Alt1	153.8	152.7
72	Alt3	Alt2	Alt2	Alt1	124.9	66.0
73	FWOP	FWOP	FWOP	Alt2	0.8	32.6
74	Alt1	FWOP	FWOP	Alt2	29.7	18.1
75	Alt2	FWOP	FWOP	Alt2	145.2	148.1
76	Alt3	FWOP	FWOP	Alt2	116.3	61.4
77	FWOP	Alt1	FWOP	Alt2	3.6	38.1
78	Alt1	Alt1	FWOP	Alt2	32.5	23.6
79	Alt2	Alt1	FWOP	Alt2	148.0	153.6
80	Alt3	Alt1	FWOP	Alt2	119.2	67.0

Table 3-3 (cont). Alternatives analysis using the WUCT in the HRHR Study Competing restoration alternatives are shown as rows, and the alternative used in the plan is denoted by the number shown.

Plan	Rondout	Moodna1	Moodna2	Moodna3	Benefits Herring (HU)	Benefits Eel (HU)
81	FWOP	Alt2	FWOP	Alt2	2.8	37.2
82	Alt1	Alt2	FWOP	Alt2	31.7	22.7
83	Alt2	Alt2	FWOP	Alt2	147.2	152.7
84	Alt3	Alt2	FWOP	Alt2	118.4	66.0
85	FWOP	FWOP	Alt1	Alt2	10.2	51.2
86	Alt1	FWOP	Alt1	Alt2	39.0	36.7
87	Alt2	FWOP	Alt1	Alt2	154.6	166.7
88	Alt3	FWOP	Alt1	Alt2	125.7	80.0
89	FWOP	Alt1	Alt1	Alt2	45.7	84.6
90	Alt1	Alt1	Alt1	Alt2	74.6	70.1
91	Alt2	Alt1	Alt1	Alt2	190.1	200.1
92	Alt3	Alt1	Alt1	Alt2	161.3	113.5
93	FWOP	Alt2	Alt1	Alt2	35.6	79.0
94	Alt1	Alt2	Alt1	Alt2	64.5	64.6
95	Alt2	Alt2	Alt1	Alt2	180.0	194.5
96	Alt3	Alt2	Alt1	Alt2	151.1	107.9
97	FWOP	FWOP	Alt2	Alt2	2.7	32.6
98	Alt1	FWOP	Alt2	Alt2	31.6	18.1
99	Alt2	FWOP	Alt2	Alt2	147.1	148.1
100	Alt3	FWOP	Alt2	Alt2	118.2	61.4

Table 3-3 (cont). Alternatives analysis using the WUCT in the HRHR Study Competing restoration alternatives are shown as rows, and the alternative used in the plan is denoted by the number shown.

Plan	Rondout	Moodna1	Moodna2	Moodna3	Benefits Herring (HU)	Benefits Eel (HU)
101	FWOP	Alt1	Alt2	Alt2	12.1	38.1
102	Alt1	Alt1	Alt2	Alt2	40.9	23.6
103	Alt2	Alt1	Alt2	Alt2	156.5	153.6
104	Alt3	Alt1	Alt2	Alt2	127.6	67.0
105	FWOP	Alt2	Alt2	Alt2	9.4	37.2
106	Alt1	Alt2	Alt2	Alt2	38.3	22.7
107	Alt2	Alt2	Alt2	Alt2	153.8	152.7
108	Alt3	Alt2	Alt2	Alt2	124.9	66.0

4.0 References

Bartoldus, Candy C., Edward W. Garbisch, and Mark L. Kraus. 1994. Evaluation of Planned Wetlands. St. Michaels, Maryland: Environmental Concern Inc.

Bonham, C. D. 1989. Measurements for Terrestrial Vegetation, John Wiley & Sons, New York, New York.

Brown, Lauren. 1979. Grasses an Identification Guide. Houghton Mifflin Company, New York, New York.

Bullock, J. 1996. Ecological Census Techniques: A Handbook, University Press. New York, New York.

Cowardin A.P. et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States, U.S. Fish and Wildlife Service, Washington, D.C.

Knobel, Edward. 1980. Field Guide to the Grasses, Sedges and Rushes of the United States. Dover Publications, Inc., New York.

Louis Berger US, Inc & Hudsonia, Ltd. 2017. Natural Resource Inventory and Assessment of Conservation Priorities of the Binnen Kill and its Tidal Habitats prepared for NEIWPCC and NYSDEC.

Mueller-Dombois, D. and H. Ellenburg. 1974. Aims and Methods of Vegetation Ecology, Wiley & Sons, New York, New York.

Oosting, H.J. 1956. The Study of Plant Communities: An Introduction to Plant Ecology, W.R. Freeman and Co., San Francisco.

Petrides, George, A. 1972. A Field Guide to Trees and Shrubs, Northeastern and north-central United States and southeastern and south-central Canada. Houghton Mifflin Company, New York, New York.

Symonds, George, W.D. 1963. The Shrub Identification Book. Harper Collins Publishers, Inc., New York, New York.

Symonds, George, W.D. 1958. The Tree Identification Book. Harper Collins Publishers, Inc., New York, New York.

United States Department of Interior, Fish and Wildlife Service. 1979. Classification of Wetlands and Deepwater Habitats of the United States.

Uva, Richard, H. 1997. Weeds of the Northeast. Cornell University Press, New York, New York.

Attachment A

EPW Photograph Log

VIEW #1 **Henry Hudson Park** View of existing tidal mud flat (EPW Sample Point: Mud Flat-1).	
VIEW #2 **Henry Hudson Park** View of existing emergent/scrub shrub wetland that formed behind a remnant section of bulkhead onsite (EPW Sample Point: EM/SS Wetland-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #3 **Henry Hudson Park** View of existing open water/remnant bulkhead (EPW Sample Point: OW/Bulkhead).	
VIEW #4 **Charles Rider Park** View of existing open water and shoreline condition A (EPW Sample Point: OW-Shoreline-A).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #5 **Charles Rider Park** View of existing open water and shoreline condition B (EPW Sample Point: OW-Shoreline-B).	
VIEW #6 **Charles Rider Park** View of existing open water/remnant bulkhead (EPW Sample Point: OW/Bulkhead).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #7 **Binnen Kill** View of existing shallow emergent marsh-condition 2 (EPW Sample Point: S-EM-2).	
VIEW #8 **Binnen Kill** View of existing shallow emergent marsh-condition 1 (EPW Sample Point: S-EM-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #9 **Binnen Kill** View of existing hardwood swamp/forested wetland-condition 1 (EPW Sample Point: FO-1).	
VIEW #10 **Binnen Kill** View of existing hardwood swamp/forested wetland with common reed understory (EPW Sample Point: FO-2).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #11 **Binnen Kill** View of existing hardwood swamp/forested wetland- condition 3 (EPW Sample Point: FO-3).	
VIEW #12 **Binnen Kill** View of existing tidal common reed wetland (EPW Sample Point: Phrag-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #13 **Binnen Kill** View of existing freshwater common reed wetland (EPW Sample Point: Phrag-2).	
VIEW #14 **Binnen Kill** View of existing reed canary wetlands (EPW Sample Point: RC-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #15 **Binnen Kill** View of existing wet meadow wetlands (EPW Sample Point: WM-1).	
VIEW #16 **Binnen Kill** View of existing upper intertidal marsh (EPW Sample Point: IM-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #17 **Binnen Kill** View of existing lower intertidal marsh (EPW Sample Point: LIM-1).	
VIEW #18 **Binnen Kill** View of existing submerged aquatic vegetation beds within the Hudson River (EPW Sample Point: SAV-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #19 **Schodack Island** View of existing Pocket intertidal emergent marsh (EPW Sample Point: Pocket EM-1).	
VIEW #20 **Schodack Island** View of existing upper intertidal emergent marsh-condition 4 (EPW Sample Point: EM-R-4).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #21 **Schodack Island** View of existing Common Reed (Phragmites australis) marsh (EPW Sample Point: Phrag-2).	
VIEW #22 **Schodack Island** View of existing upper intertidal emergent marsh-condition 3 (EPW Sample Point: EM-R-3).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #23 **Schodack Island** View of existing lower intertidal emergent marsh-condition 2 (EPW Sample Point: EM-R-2).	
VIEW #24 **Schodack Island** View of existing unvegetated flats/mud flat (EPW Sample Point: UV-1).	

VIEW #25 **Schodack Island** View of existing Common Reed (Phragmites australis) marsh (EPW Sample Point: Phrag-1).	
VIEW #26 **Schodack Island** View of existing wooded swamp/ forested wetland (EPW Sample Point: FO-R-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #27 **Schodack Island** View of existing upper intertidal emergent/scrub shrub marsh (EPW Sample Point: EM/SS-R-1).	
VIEW #28 **Schodack Island** View of existing upper intertidal emergent marsh-condition 1 (EPW Sample Point: EM-R-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

VIEW #29 **Schodack Island** View of existing scrub shrub marsh (EPW Sample Point: SS-R-1).	

	PHOTOGRAPHS & DESCRIPTIONS ***Hudson River Habitat Restoration Feasibility Study*** **Evaluation of Planned Wetlands-Photograph Log**

Attachment B

EPW Functional Capacity Index (FCI) Summary Tables

UNLOCK: 9999

Key:

USER INPUT
COMPUTATION CELL
PLACEHOLDER CELL (For remaining EPW modules)
STOP = EPW element is not abblicable
UNSUITABLE = EPW element score implies unsuitable conditions
Missing Informaiton
EPW OUTPUT

Name of Evaluator:	Brian P. Cramer
Date of Evaluation:	6/11/2018
Site Name:	Binnen Kill
Evaluation Team:	Princeton Hydro, GreenVest, USACE-NY District

EPW elements contributing to the FCI can be activated or deactivated by selecting YES or NO, respectively in the yellow boxes below

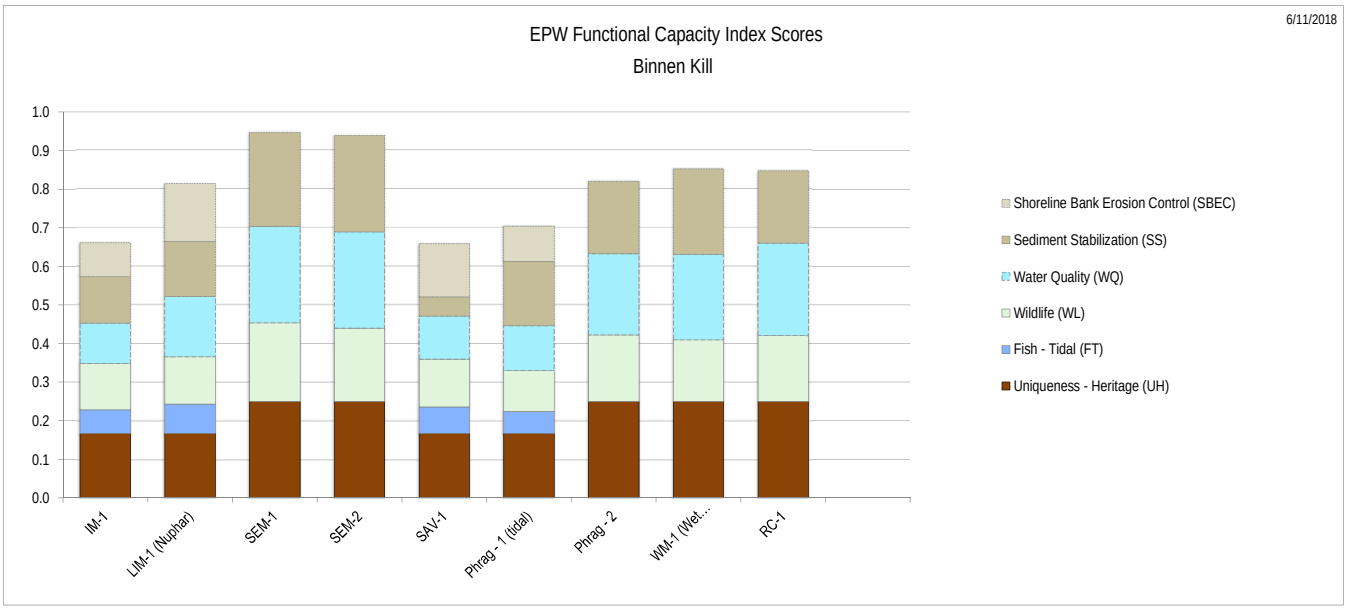
EPW Elements Contributing to FCI	IM-1	LIM-1 (Nuphar)	SEM-1	SEM-2	SAV-1	Phrag - 1 (tidal)	Phrag - 2	WM-1 (Wet meadow)	RC-1	
Shoreline Bank Erosion Control (SBEC)	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
Sediment Stabilization (SS)	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Water Quality (WQ)	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Wildlife (WL)	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Fish - Tidal (FT)	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Uniqueness - Heritage (UH_	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO

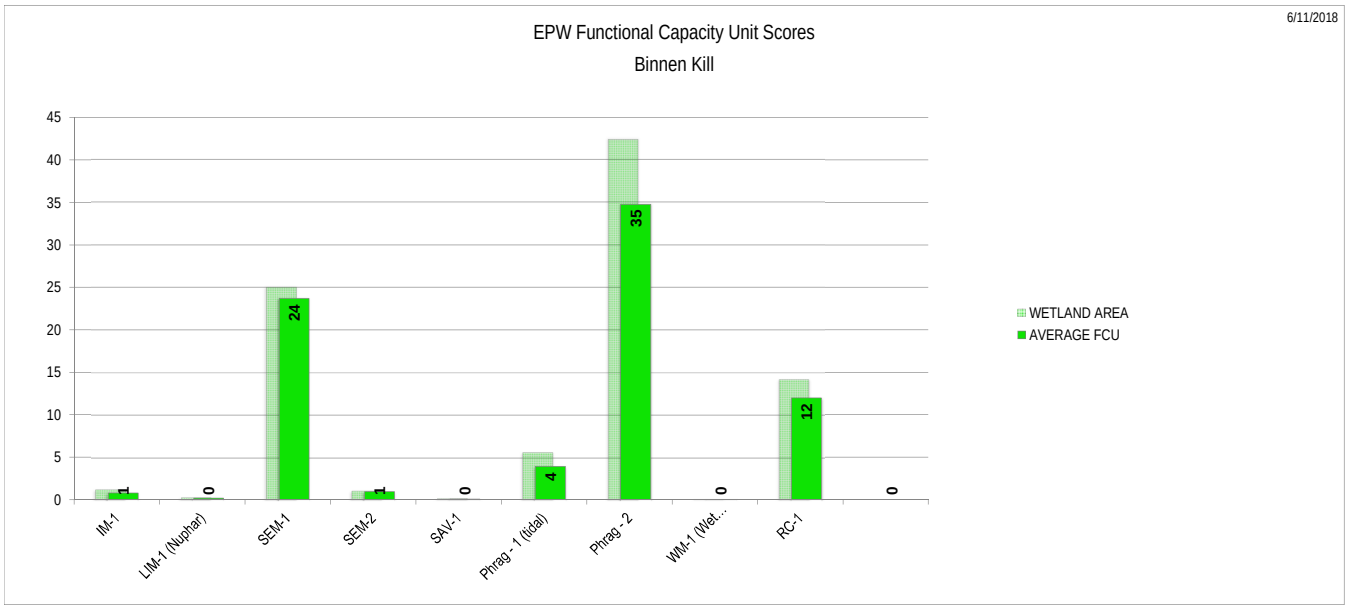
EPW Results Summary	IM-1	LIM-1 (Nuphar)	SEM-1	SEM-2	SAV-1	Phrag - 1 (tidal)	Phrag - 2	WM-1 (Wet meadow)	RC-1	
AVERAGE FCI	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.9	0.8	MISSING INFO
AVERAGE FCU	0.8	0.2	23.7	0.9	0.1	3.9	34.8	0.0	12.0	MISSING INFO

FCI Breakdown by EPW Element	IM-1	LIM-1 (Nuphar)	SEM-1	SEM-2	SAV-1	Phrag - 1 (tidal)	Phrag - 2	WM-1 (Wet meadow)	RC-1	
Shoreline Bank Erosion Control (SBEC)	0.5	0.9	NA	NA	0.8	0.6	NA	NA	NA	NA
Sediment Stabilization (SS)	0.7	0.9	1.0	1.0	0.3	1.0	0.8	0.9	0.8	NA
Water Quality (WQ)	0.6	0.9	1.0	1.0	0.7	0.7	0.8	0.9	1.0	NA
Wildlife (WL)	0.7	0.7	0.8	0.8	0.7	0.6	0.7	0.6	0.7	NA
Fish - Tidal (FT)	0.4	0.5	NA	NA	0.4	0.3	NA	NA	NA	NA
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	NA
AVERAGE FCI	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.9	0.8	MISSING INFO

FCU Breakdown by EPW Element	IM-1	LIM-1 (Nuphar)	SEM-1	SEM-2	SAV-1	Phrag - 1 (tidal)	Phrag - 2	WM-1 (Wet meadow)	RC-1	
Shoreline Bank Erosion Control (SBEC)	1	0	NA	NA	0	3	NA	NA	NA	NA
Sediment Stabilization (SS)	1	0	24	1	0	6	32	0	11	NA
Water Quality (WQ)	1	0	25	1	0	4	36	0	14	NA
Wildlife (WL)	1	0	20	1	0	4	29	0	10	NA
Fish - Tidal (FT)	0	0	NA	NA	0	2	NA	NA	NA	NA
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1	0	25	1	0	6	42	0	14	NA
AVERAGE FCU	1	0	24	1	0	4	35	0	12	MISSING INFO
WETLAND AREA	1	0	25	1	0	6	42	0	14	

Fractional FCI (Used only for charted results)	IM-1	LIM-1 (Nuphar)	SEM-1	SEM-2	SAV-1	Phrag - 1 (tidal)	Phrag - 2	WM-1 (Wet meadow)	RC-1	
Shoreline Bank Erosion Control (SBEC)	0.1	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Sediment Stabilization (SS)	0.1	0.1	0.2	0.3	0.0	0.2	0.2	0.2	0.2	0.0
Water Quality (WQ)	0.1	0.2	0.3	0.3	0.1	0.1	0.2	0.2	0.2	0.0
Wildlife (WL)	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.0
Fish - Tidal (FT)	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniqueness - Heritage (UH)	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.0
EPW Elements Considered	6.0	6.0	4.0	4.0	6.0	6.0	4.0	4.0	4.0	0.0
EPW Elements Considered: Relevant to Alternative	6.0	6.0	4.0	4.0	6.0	6.0	4.0	4.0	4.0	0.0
EPW Elements Considered: Unsuitable for Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sum of Fractional FCIs (should = 0.000 or Average FCI)	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.9	0.8	0.0


6/11/2018
EPW Functional Capacity Index Scores
Binnen Kill
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
IM-1
LIM-1 (Nuphar)
SEM-1
SEM-2
SAV-1
Phrag - 1 (tidal)
Phrag - 2
WM-1 (Wet...
RC-1
Shoreline Bank Erosion Control (SBEC)
Sediment Stabilization (SS)
Water Quality (WQ)
Wildlife (WL)
Fish - Tidal (FT)
Uniqueness - Heritage (UH)


6/11/2018
EPW Functional Capacity Unit Scores
Binnen Kill
45
40
35
30
25
20
15
10
5
0
1
0
24
1
0
4
35
0
12
0
IM-1
LIM-1 (Nuphar)
SEM-1
SEM-2
SAV-1
Phrag - 1 (tidal)
Phrag - 2
WM-1 (Wet...
RC-1
WETLAND AREA
AVERAGE FCU

UNLOCK: 9999

Key:

USER INPUT
COMPUTATION CELL
PLACEHOLDER CELL (For remaining EPW modules)
STOP = EPW element is not abblicable
UNSUITABLE = EPW element score implies unsuitable conditions
Missing Informaiton
EPW OUTPUT

Name of Evaluator:	Brian P. Cramer
Date of Evaluation:	6/11/2018
Site Name:	Binnen Kill
Evaluation Team:	Princeton Hydro, GreenVest, USACE-NY District

EPW elements contributing to the FCI can be activated or deactivated by selecting YES or NO, respectively in the yellow boxes below

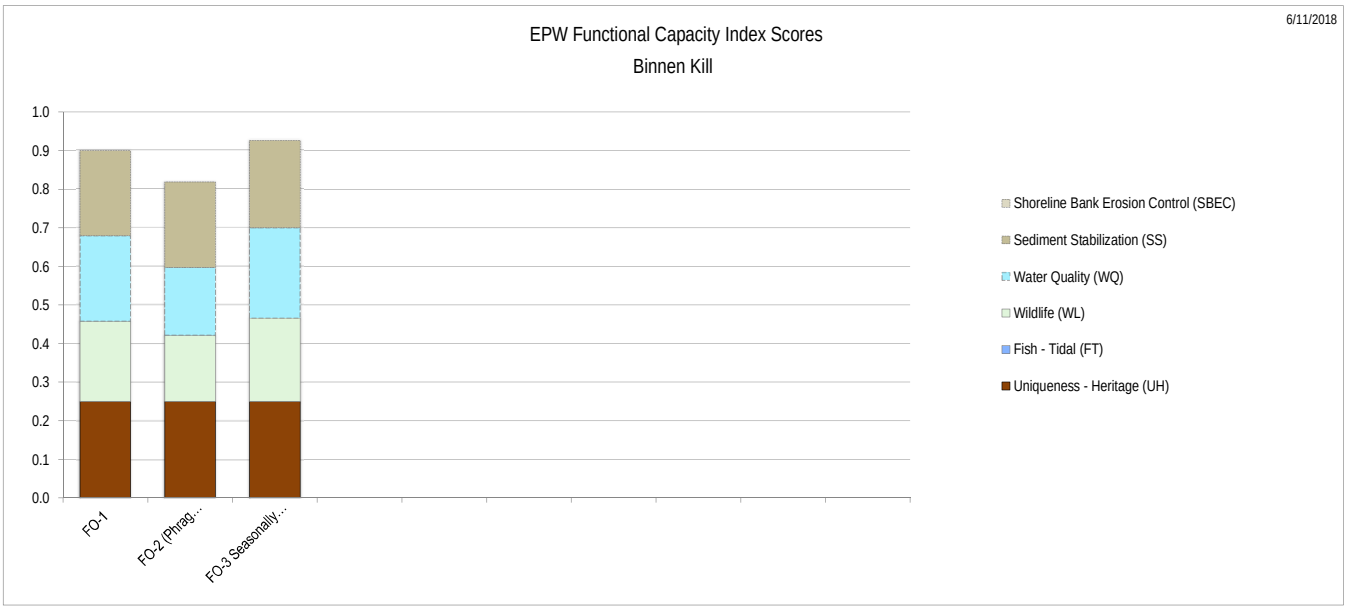
EPW Elements Contributing to FCI	FO-1	FO-2 (Phrag understory	FO-3 Seasonally Floode							
Shoreline Bank Erosion Control (SBEC)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Sediment Stabilization (SS)	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO
Water Quality (WQ)	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO
Wildlife (WL)	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO
Fish - Tidal (FT)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Uniqueness - Heritage (UH_	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO

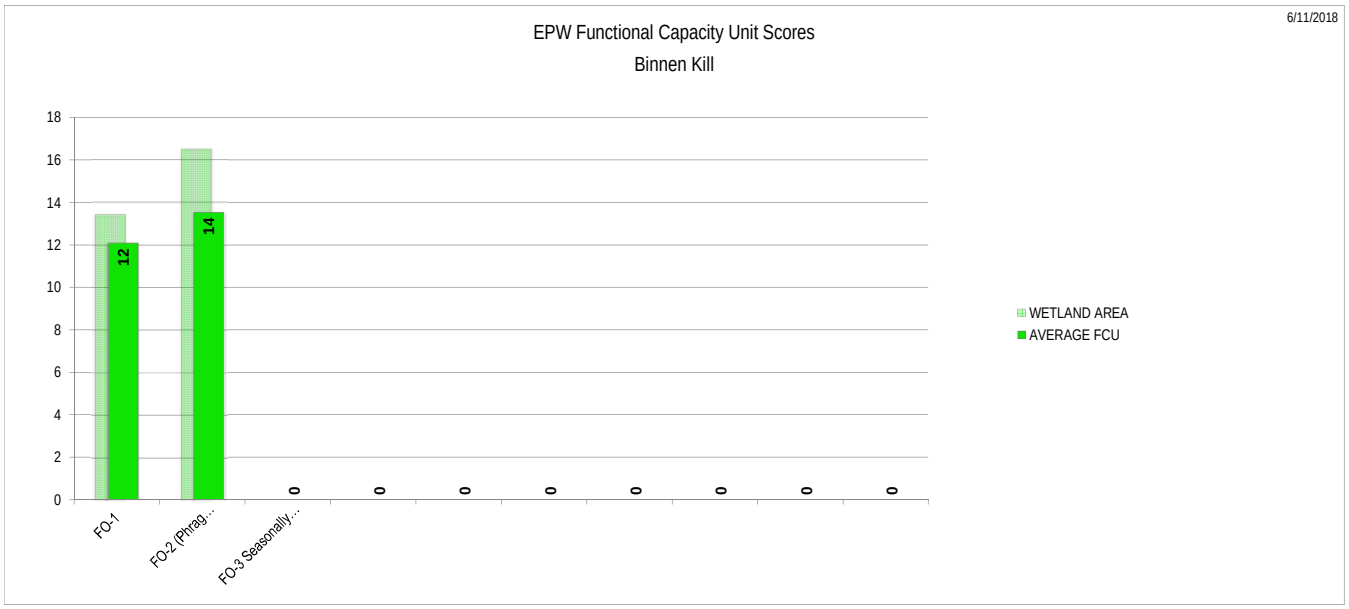
EPW Results Summary	FO-1	FO-2 (Phrag understory	FO-3 Seasonally Floode							
AVERAGE FCI	0.9	0.8	0.9	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
AVERAGE FCU	12.1	13.5	0.0	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCI Breakdown by EPW Element	FO-1	FO-2 (Phrag understory	FO-3 Seasonally Floode							
Shoreline Bank Erosion Control (SBEC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sediment Stabilization (SS)	0.9	0.9	0.9	NA	NA	NA	NA	NA	NA	NA
Water Quality (WQ)	0.9	0.7	0.9	NA	NA	NA	NA	NA	NA	NA
Wildlife (WL)	0.8	0.7	0.9	NA	NA	NA	NA	NA	NA	NA
Fish - Tidal (FT)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1.0	1.0	1.0	NA	NA	NA	NA	NA	NA	NA
AVERAGE FCI	0.9	0.8	0.9	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCU Breakdown by EPW Element	FO-1	FO-2 (Phrag understory	FO-3 Seasonally Floode							
Shoreline Bank Erosion Control (SBEC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sediment Stabilization (SS)	12	15	0	NA	NA	NA	NA	NA	NA	NA
Water Quality (WQ)	12	12	0	NA	NA	NA	NA	NA	NA	NA
Wildlife (WL)	11	11	0	NA	NA	NA	NA	NA	NA	NA
Fish - Tidal (FT)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	13	17	0	NA	NA	NA	NA	NA	NA	NA
AVERAGE FCU	12	14	0	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
WETLAND AREA	13	17	0							

Fractional FCI (Used only for charted results)	FO-1	FO-2 (Phrag understory	FO-3 Seasonally Floode							
Shoreline Bank Erosion Control (SBEC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sediment Stabilization (SS)	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Quality (WQ)	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wildlife (WL)	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish - Tidal (FT)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniqueness - Heritage (UH)	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPW Elements Considered	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPW Elements Considered: Relevant to Alternative	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPW Elements Considered: Unsuitable for Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sum of Fractional FCIs (should = 0.000 or Average FCI)	0.9	0.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0


6/11/2018
EPW Functional Capacity Index Scores
Binnen Kill
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
FO-1
FO-2 (Phrag...
FO-3 Seasonally...
Shoreline Bank Erosion Control (SBEC)
Sediment Stabilization (SS)
Water Quality (WQ)
Wildlife (WL)
Fish - Tidal (FT)
Uniqueness - Heritage (UH)


6/11/2018
EPW Functional Capacity Unit Scores
Binnen Kill
18
16
14
12
10
8
6
4
2
0
12
14
0
0
0
0
0
0
0
0
FO-1
FO-2 (Phrag...
FO-3 Seasonally...
WETLAND AREA
AVERAGE FCU

UNLOCK: 9999

Key:

USER INPUT
COMPUTATION CELL
PLACEHOLDER CELL (For remaining EPW modules)
STOP = EPW element is not abblicable
UNSUITABLE = EPW element score implies unsuitable conditions
Missing Informaiton
EPW OUTPUT

Name of Evaluator:	Brian P. Cramer
Date of Evaluation:	04-06-2018; 08-06-2018
Site Name:	Schodack
Evaluation Team:	Princeton Hydro, GreenVest, USACE-NY District

EPW elements contributing to the FCI can be activated or deactivated by selecting YES or NO, respectively in the yellow boxes below

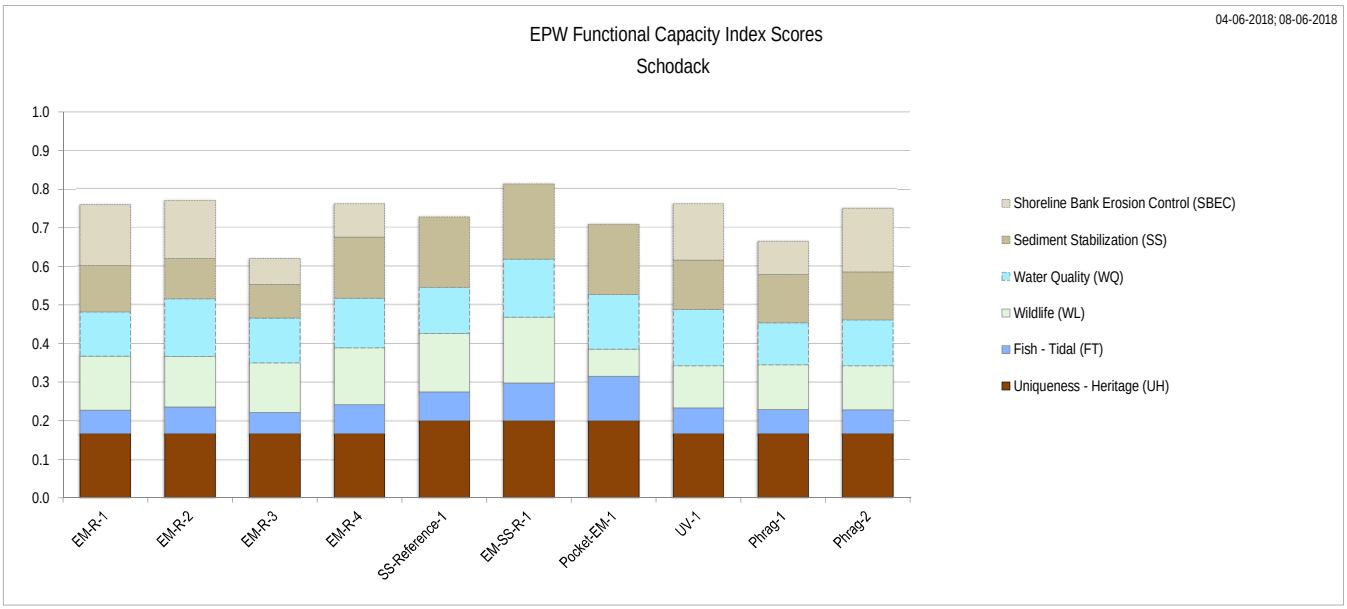
EPW Elements Contributing to FCI	EM-R-1	EM-R-2	EM-R-3	EM-R-4	SS-Reference-1	EM-SS-R-1	Pocket-EM-1	UV-1	Phrag-1	Phrag-2
Shoreline Bank Erosion Control (SBEC)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sediment Stabilization (SS)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Water Quality (WQ)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Wildlife (WL)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fish - Tidal (FT)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Uniqueness - Heritage (UH_	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

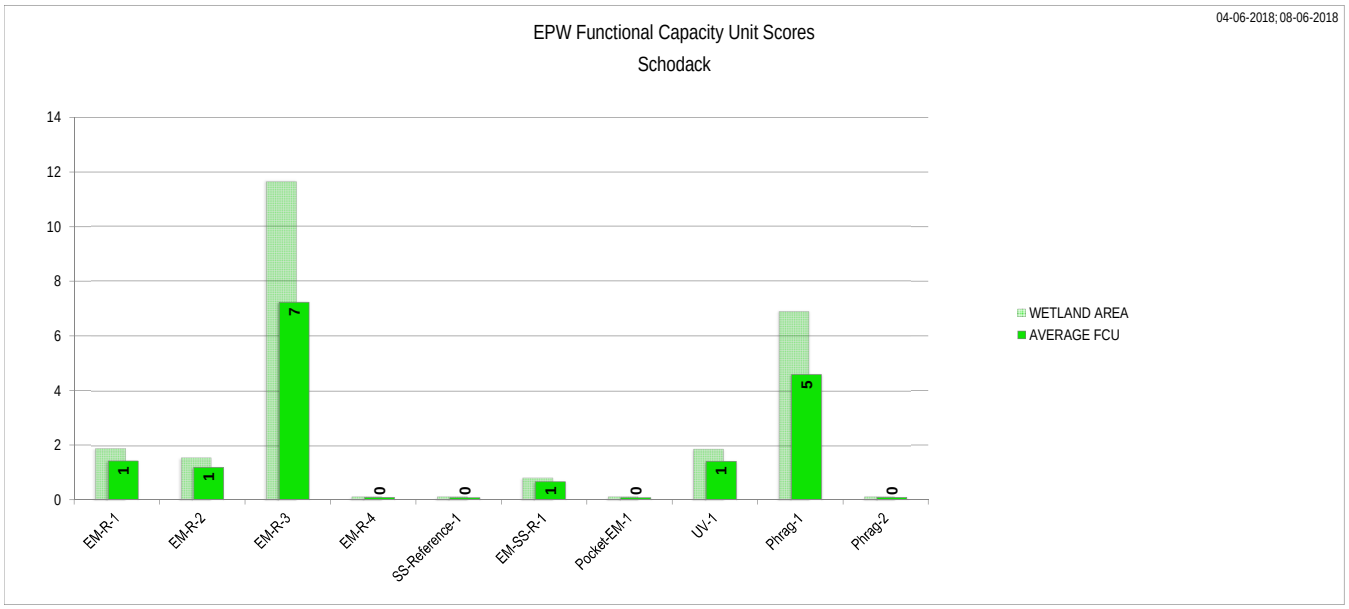
EPW Results Summary	EM-R-1	EM-R-2	EM-R-3	EM-R-4	SS-Reference-1	EM-SS-R-1	Pocket-EM-1	UV-1	Phrag-1	Phrag-2
AVERAGE FCI	0.8	0.8	0.6	0.8	0.7	0.8	0.7	0.8	0.7	0.8
AVERAGE FCU	1.4	1.2	7.2	0.1	0.1	0.7	0.1	1.4	4.6	0.1

FCI Breakdown by EPW Element	EM-R-1	EM-R-2	EM-R-3	EM-R-4	SS-Reference-1	EM-SS-R-1	Pocket-EM-1	UV-1	Phrag-1	Phrag-2
Shoreline Bank Erosion Control (SBEC)	0.9	0.9	0.4	0.5	STOP	STOP	STOP	0.9	0.5	1.0
Sediment Stabilization (SS)	0.7	0.6	0.5	1.0	0.9	1.0	0.9	0.8	0.8	0.8
Water Quality (WQ)	0.7	0.9	0.7	0.8	0.6	0.8	0.7	0.9	0.7	0.7
Wildlife (WL)	0.8	0.8	0.8	0.9	0.8	0.9	0.4	0.7	0.7	0.7
Fish - Tidal (FT)	0.4	0.4	0.3	0.5	0.4	0.5	0.6	0.4	0.4	0.4
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
AVERAGE FCI	0.8	0.8	0.6	0.8	0.7	0.8	0.7	0.8	0.7	0.8

FCU Breakdown by EPW Element	EM-R-1	EM-R-2	EM-R-3	EM-R-4	SS-Reference-1	EM-SS-R-1	Pocket-EM-1	UV-1	Phrag-1	Phrag-2
Shoreline Bank Erosion Control (SBEC)	2	1	5	0	STOP	STOP	STOP	2	4	0
Sediment Stabilization (SS)	1	1	6	0	0	1	0	1	5	0
Water Quality (WQ)	1	1	8	0	0	1	0	2	4	0
Wildlife (WL)	2	1	9	0	0	1	0	1	5	0
Fish - Tidal (FT)	1	1	4	0	0	0	0	1	3	0
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	2	2	12	0	0	1	0	2	7	0
AVERAGE FCU	1	1	7	0	0	1	0	1	5	0
WETLAND AREA	2	2	12	0	0	1	0	2	7	0

Fractional FCI (Used only for charted results)	EM-R-1	EM-R-2	EM-R-3	EM-R-4	SS-Reference-1	EM-SS-R-1	Pocket-EM-1	UV-1	Phrag-1	Phrag-2
Shoreline Bank Erosion Control (SBEC)	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2
Sediment Stabilization (SS)	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Water Quality (WQ)	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Wildlife (WL)	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
Fish - Tidal (FT)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniqueness - Heritage (UH)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
EPW Elements Considered	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPW Elements Considered: Relevant to Alternative	6.0	6.0	6.0	6.0	5.0	5.0	5.0	6.0	6.0	6.0
EPW Elements Considered: Unsuitable for Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sum of Fractional FCIs (should = 0.000 or Average FCI)	0.8	0.8	0.6	0.8	0.7	0.8	0.7	0.8	0.7	0.8


04-06-2018; 08-06-2018
EPW Functional Capacity Index Scores
Schodack
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
EM-R-1
EM-R-2
EM-R-3
EM-R-4
SS-Reference-1
EM-SS-R-1
Pocket-EM-1
UV-1
Phrag-1
Phrag-2
Shoreline Bank Erosion Control (SBEC)
Sediment Stabilization (SS)
Water Quality (WQ)
Wildlife (WL)
Fish - Tidal (FT)
Uniqueness - Heritage (UH)


04-06-2018; 08-06-2018
EPW Functional Capacity Unit Scores
Schodack
14
12
10
8
6
4
2
0
1
1
7
0
0
1
0
1
5
0
EM-R-1
EM-R-2
EM-R-3
EM-R-4
SS-Reference-1
EM-SS-R-1
Pocket-EM-1
UV-1
Phrag-1
Phrag-2
WETLAND AREA
AVERAGE FCU

UNLOCK: 9999

Key:

USER INPUT
COMPUTATION CELL
PLACEHOLDER CELL (For remaining EPW modules)
STOP = EPW element is not abblicable
UNSUITABLE = EPW element score implies unsuitable conditions
Missing Informaiton
EPW OUTPUT

Name of Evaluator:	Brian P. Cramer
Date of Evaluation:	04-06-2018; 08-06-2018
Site Name:	Schodack (forested)
Evaluation Team:	Princeton Hydro, GreenVest, USACE-NY District

EPW elements contributing to the FCI can be activated or deactivated by selecting YES or NO, respectively in the yellow boxes below

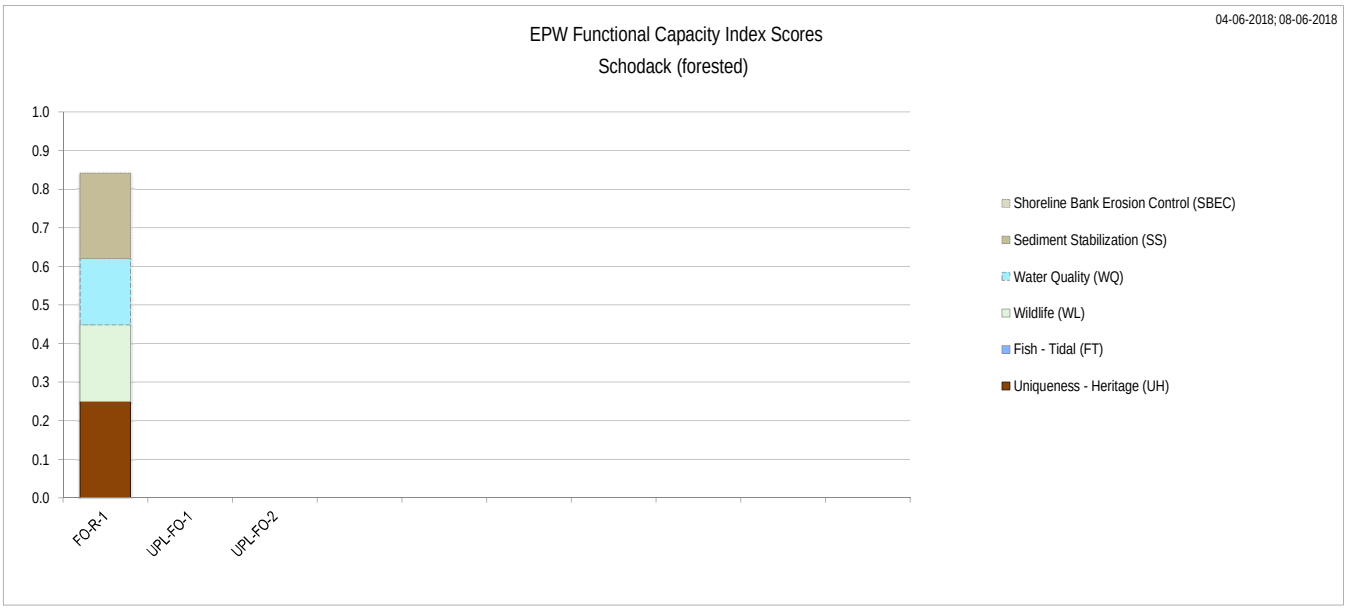
EPW Elements Contributing to FCI	FO-R-1	UPL-FO-1	UPL-FO-2							
Shoreline Bank Erosion Control (SBEC)	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES
Sediment Stabilization (SS)	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES
Water Quality (WQ)	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES
Wildlife (WL)	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES
Fish - Tidal (FT)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Uniqueness - Heritage (UH_	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES

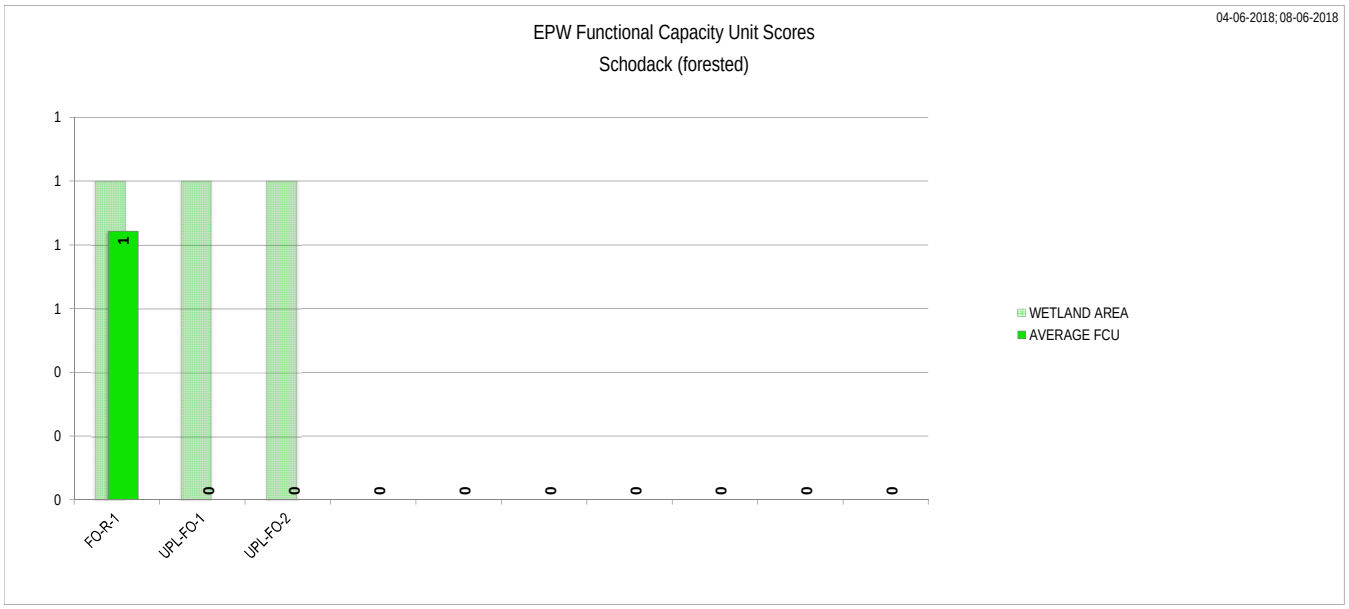
EPW Results Summary	FO-R-1	UPL-FO-1	UPL-FO-2							
AVERAGE FCI	0.8	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
AVERAGE FCU	0.8	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCI Breakdown by EPW Element	FO-R-1	UPL-FO-1	UPL-FO-2							
Shoreline Bank Erosion Control (SBEC)	NA	NA	NA	NV	NV	NV	NV	NV	NV	NV
Sediment Stabilization (SS)	0.9	NA	NA	NV	NV	NV	NV	NV	NV	NV
Water Quality (WQ)	0.7	NA	NA	NV	NV	NV	NV	NV	NV	NV
Wildlife (WL)	0.8	NA	NA	NV	NV	NV	NV	NV	NV	NV
Fish - Tidal (FT)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	YES	YES	YES	YES	YES	YES	YES
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1.0	NA	NA	NV	NV	NV	NV	NV	NV	NV
AVERAGE FCI	0.8	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCU Breakdown by EPW Element	FO-R-1	UPL-FO-1	UPL-FO-2							
Shoreline Bank Erosion Control (SBEC)	NA	NA	NA	NV	NV	NV	NV	NV	NV	NV
Sediment Stabilization (SS)	1	NA	NA	NV	NV	NV	NV	NV	NV	NV
Water Quality (WQ)	1	NA	NA	NV	NV	NV	NV	NV	NV	NV
Wildlife (WL)	1	NA	NA	NV	NV	NV	NV	NV	NV	NV
Fish - Tidal (FT)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	YES	YES	YES	YES	YES	YES	YES
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1	NA	NA	NV	NV	NV	NV	NV	NV	NV
AVERAGE FCU	1	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
WETLAND AREA	1	1	1							

Fractional FCI (Used only for charted results)	FO-R-1	UPL-FO-1	UPL-FO-2							
Shoreline Bank Erosion Control (SBEC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sediment Stabilization (SS)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Quality (WQ)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wildlife (WL)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish - Tidal (FT)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniqueness - Heritage (UH)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPW Elements Considered	4.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPW Elements Considered: Relevant to Alternative	4.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPW Elements Considered: Unsuitable for Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sum of Fractional FCIs (should = 0.000 or Average FCI)	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0


04-06-2018; 08-06-2018
EPW Functional Capacity Index Scores
Schodack (forested)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
FO-R-1
UPL-FO-1
UPL-FO-2
Shoreline Bank Erosion Control (SBEC)
Sediment Stabilization (SS)
Water Quality (WQ)
Wildlife (WL)
Fish - Tidal (FT)
Uniqueness - Heritage (UH)


04-06-2018; 08-06-2018
EPW Functional Capacity Unit Scores
Schodack (forested)
1
1
1
1
0
0
0
1
0
0
0
0
0
0
0
0
FO-R-1
UPL-FO-1
UPL-FO-2
WETLAND AREA
AVERAGE FCU

UNLOCK: 9999

Key:

USER INPUT
COMPUTATION CELL
PLACEHOLDER CELL (For remaining EPW modules)
STOP = EPW element is not abblicable
UNSUITABLE = EPW element score implies unsuitable conditions
Missing Informaiton
EPW OUTPUT

Name of Evaluator:	Brian P. Cramer
Date of Evaluation:	6/5/2018
Site Name:	Charles Rider
Evaluation Team:	Princeton Hydro, GreenVest, USACE-NY District

EPW elements contributing to the FCI can be activated or deactivated by selecting YES or NO, respectively in the yellow boxes below

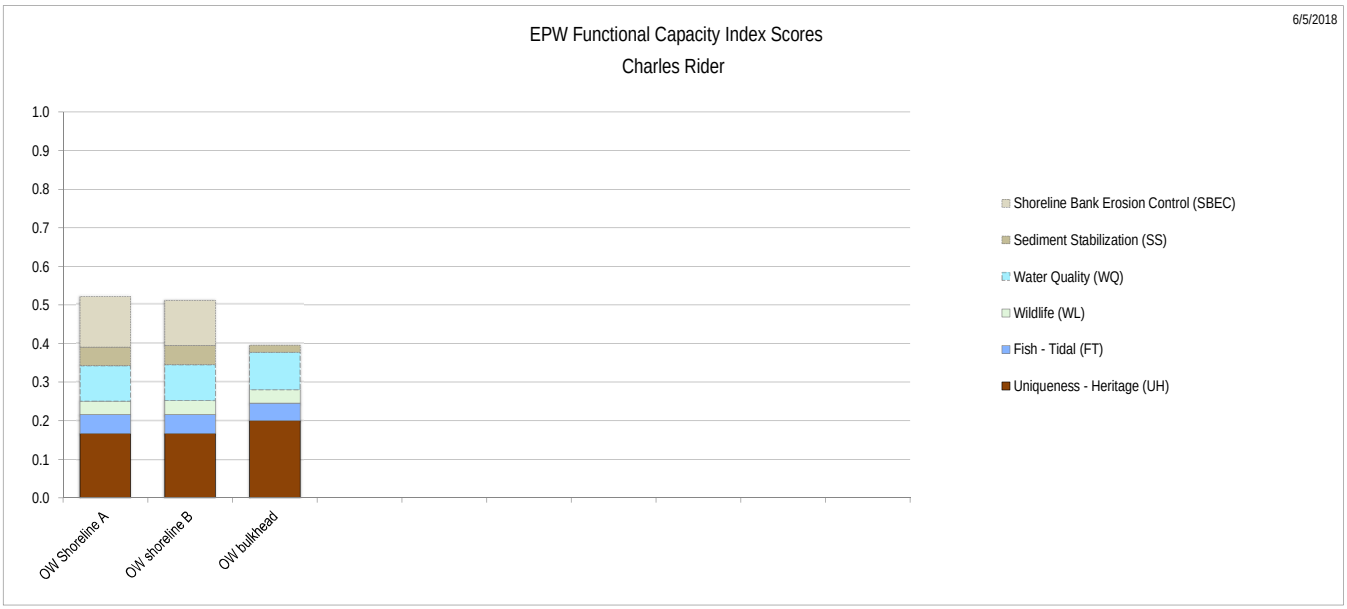
EPW Elements Contributing to FCI	OW Shoreline A	OW shoreline B	OW bulkhead							
Shoreline Bank Erosion Control (SBEC)	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES
Sediment Stabilization (SS)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Water Quality (WQ)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Wildlife (WL)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fish - Tidal (FT)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Uniqueness - Heritage (UH_	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

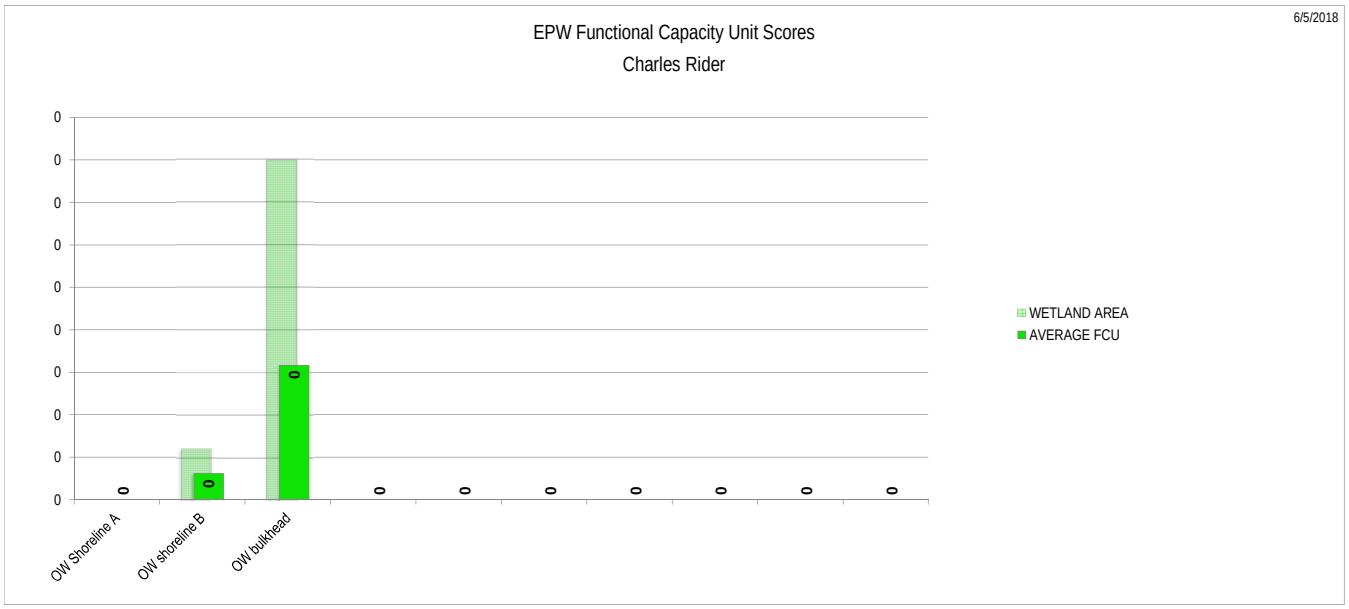
EPW Results Summary	OW Shoreline A	OW shoreline B	OW bulkhead							
AVERAGE FCI	0.5	0.5	0.4	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
AVERAGE FCU	0.0	0.0	0.2	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCI Breakdown by EPW Element	OW Shoreline A	OW shoreline B	OW bulkhead							
Shoreline Bank Erosion Control (SBEC)	0.8	0.7	NA	NV	NV	NV	NV	NV	NV	NV
Sediment Stabilization (SS)	0.3	0.3	0.1	NV	NV	NV	NV	NV	NV	NV
Water Quality (WQ)	0.6	0.6	0.5	NV	NV	NV	NV	NV	NV	NV
Wildlife (WL)	0.2	0.2	0.2	NV	NV	NV	NV	NV	NV	NV
Fish - Tidal (FT)	0.3	0.3	0.2	NV	NV	NV	NV	NV	NV	NV
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1.0	1.0	1.0	NV	NV	NV	NV	NV	NV	NV
AVERAGE FCI	0.5	0.5	0.4	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCU Breakdown by EPW Element	OW Shoreline A	OW shoreline B	OW bulkhead							
Shoreline Bank Erosion Control (SBEC)	0	0	NA	NV	NV	NV	NV	NV	NV	NV
Sediment Stabilization (SS)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Water Quality (WQ)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Wildlife (WL)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Fish - Tidal (FT)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	0	0	0	NV	NV	NV	NV	NV	NV	NV
AVERAGE FCU	0	0	0	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
WETLAND AREA	0	0	0							

Fractional FCI (Used only for charted results)	OW Shoreline A	OW shoreline B	OW bulkhead							
Shoreline Bank Erosion Control (SBEC)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sediment Stabilization (SS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Quality (WQ)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wildlife (WL)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish - Tidal (FT)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniqueness - Heritage (UH)	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPW Elements Considered	6.0	6.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPW Elements Considered: Relevant to Alternative	6.0	6.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPW Elements Considered: Unsuitable for Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sum of Fractional FCIs (should = 0.000 or Average FCI)	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0


6/5/2018
EPW Functional Capacity Index Scores
Charles Rider
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
OW Shoreline A
OW shoreline B
OW bulkhead
Shoreline Bank Erosion Control (SBEC)
Sediment Stabilization (SS)
Water Quality (WQ)
Wildlife (WL)
Fish - Tidal (FT)
Uniqueness - Heritage (UH)


6/5/2018
EPW Functional Capacity Unit Scores
Charles Rider
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
OW Shoreline A
OW shoreline B
OW bulkhead
WETLAND AREA
AVERAGE FCU

UNLOCK: 9999

Key:

USER INPUT
COMPUTATION CELL
PLACEHOLDER CELL (For remaining EPW modules)
STOP = EPW element is not abblicable
UNSUITABLE = EPW element score implies unsuitable conditions
Missing Informaiton
EPW OUTPUT

Name of Evaluator:	Brian P. Cramer
Date of Evaluation:	6/5/2018
Site Name:	Henry Hudson
Evaluation Team:	Princeton Hydro, GreenVest, USACE-NY District

EPW elements contributing to the FCI can be activated or deactivated by selecting YES or NO, respectively in the yellow boxes below

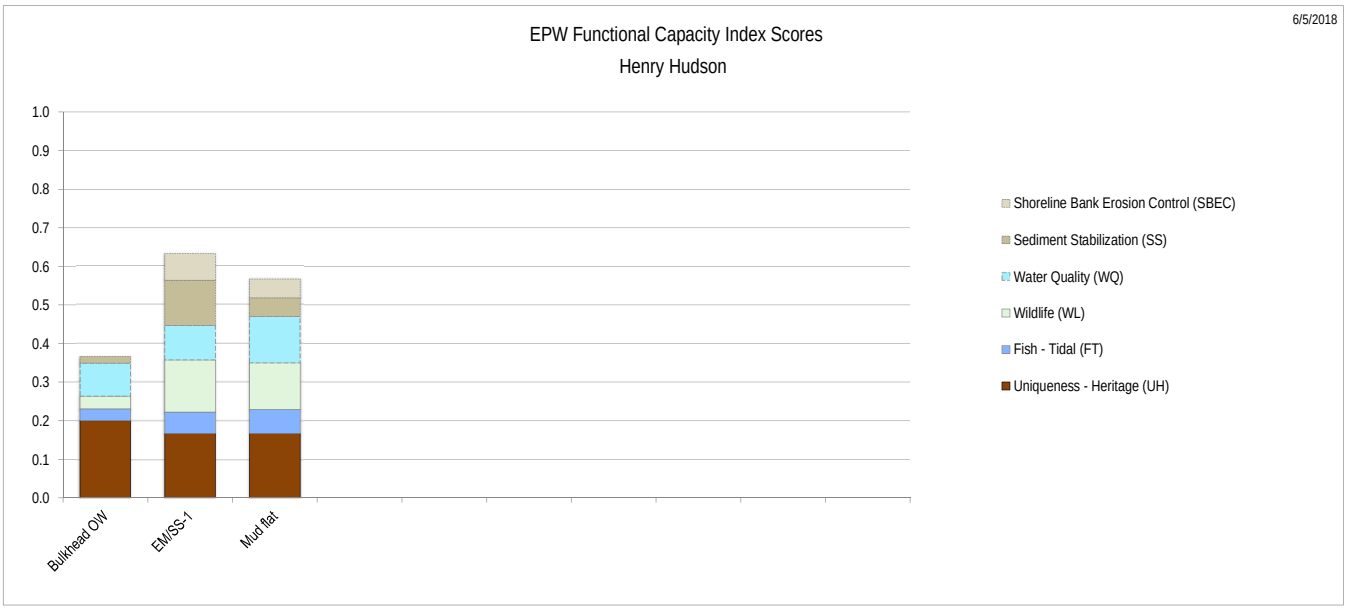
EPW Elements Contributing to FCI	Bulkhead OW	EM/SS-1	Mud flat							
Shoreline Bank Erosion Control (SBEC)	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sediment Stabilization (SS)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Water Quality (WQ)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Wildlife (WL)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fish - Tidal (FT)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Uniqueness - Heritage (UH_	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

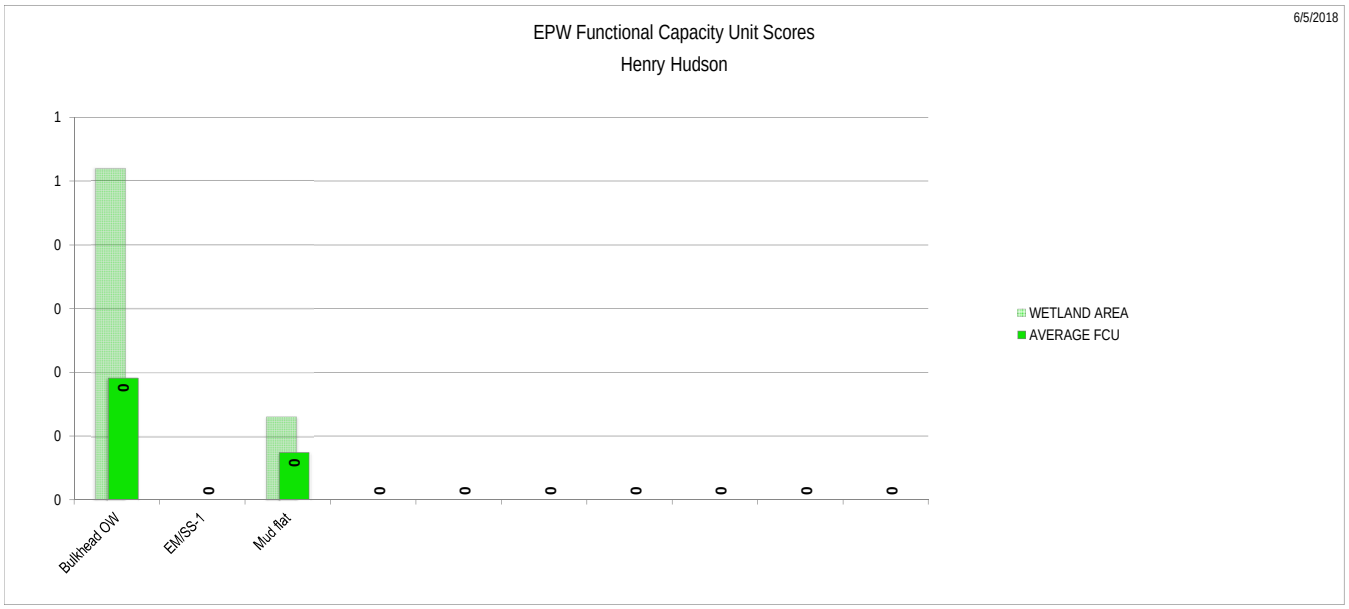
EPW Results Summary	Bulkhead OW	EM/SS-1	Mud flat							
AVERAGE FCI	0.4	0.6	0.6	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
AVERAGE FCU	0.2	0.0	0.1	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCI Breakdown by EPW Element	Bulkhead OW	EM/SS-1	Mud flat							
Shoreline Bank Erosion Control (SBEC)	NA	0.4	0.3	NV	NV	NV	NV	NV	NV	NV
Sediment Stabilization (SS)	0.1	0.7	0.3	NV	NV	NV	NV	NV	NV	NV
Water Quality (WQ)	0.4	0.5	0.7	NV	NV	NV	NV	NV	NV	NV
Wildlife (WL)	0.2	0.8	0.7	NV	NV	NV	NV	NV	NV	NV
Fish - Tidal (FT)	0.2	0.3	0.4	NV	NV	NV	NV	NV	NV	NV
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1.0	1.0	1.0	NV	NV	NV	NV	NV	NV	NV
AVERAGE FCI	0.4	0.6	0.6	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO

FCU Breakdown by EPW Element	Bulkhead OW	EM/SS-1	Mud flat							
Shoreline Bank Erosion Control (SBEC)	NA	0	0	NV	NV	NV	NV	NV	NV	NV
Sediment Stabilization (SS)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Water Quality (WQ)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Wildlife (WL)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Fish - Tidal (FT)	0	0	0	NV	NV	NV	NV	NV	NV	NV
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uniqueness - Heritage (UH_	1	0	0	NV	NV	NV	NV	NV	NV	NV
AVERAGE FCU	0	0	0	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO	MISSING INFO
WETLAND AREA	1	0	0							

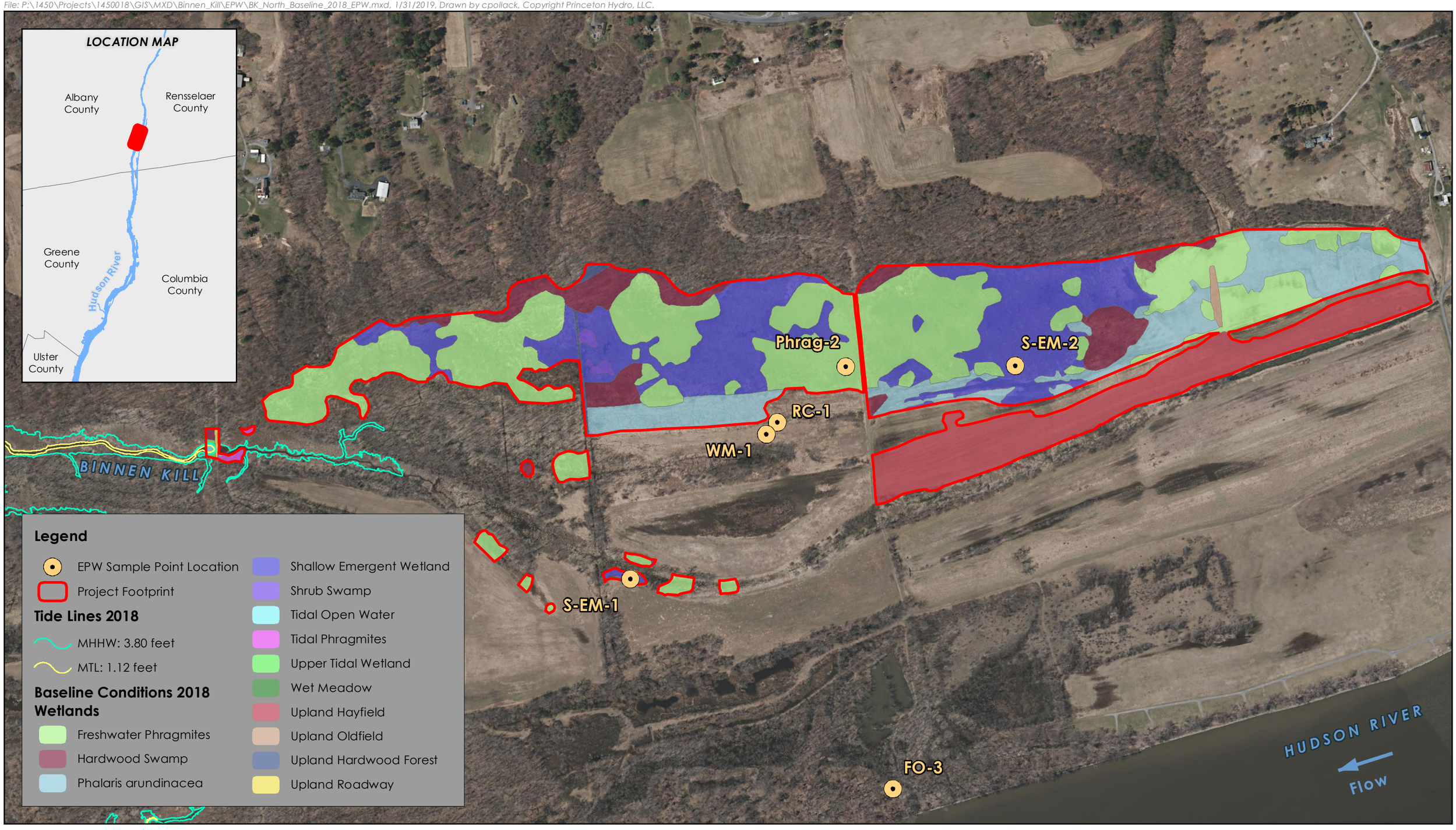
Fractional FCI (Used only for charted results)	Bulkhead OW	EM/SS-1	Mud flat							
Shoreline Bank Erosion Control (SBEC)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sediment Stabilization (SS)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Quality (WQ)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wildlife (WL)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish - Tidal (FT)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Streams and Rivers (FNTSR) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fish Non-Tidal Ponds and Lakes (FNTPL) - UNUSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniqueness - Heritage (UH)	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPW Elements Considered	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPW Elements Considered: Relevant to Alternative	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPW Elements Considered: Unsuitable for Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sum of Fractional FCIs (should = 0.000 or Average FCI)	0.4	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0


6/5/2018
EPW Functional Capacity Index Scores
Henry Hudson
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Bulkhead OW
EM/SS-1
Mud flat
Shoreline Bank Erosion Control (SBEC)
Sediment Stabilization (SS)
Water Quality (WQ)
Wildlife (WL)
Fish - Tidal (FT)
Uniqueness - Heritage (UH)


6/5/2018
EPW Functional Capacity Unit Scores
Henry Hudson
1
1
0
0
0
0
0
Bulkhead OW
EM/SS-1
Mud flat
WETLAND AREA
AVERAGE FCU

Attachment C
EPW Figures for Baseline, TSP, Recommended Plan

File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\EPW\BK_North_Baseline_2018_EPW.mxd, 1/31/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.



US Army Corps of Engineers®
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on data obtained from the 2017 Natural Resource Inventory of the Binnen Kill.
3. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.

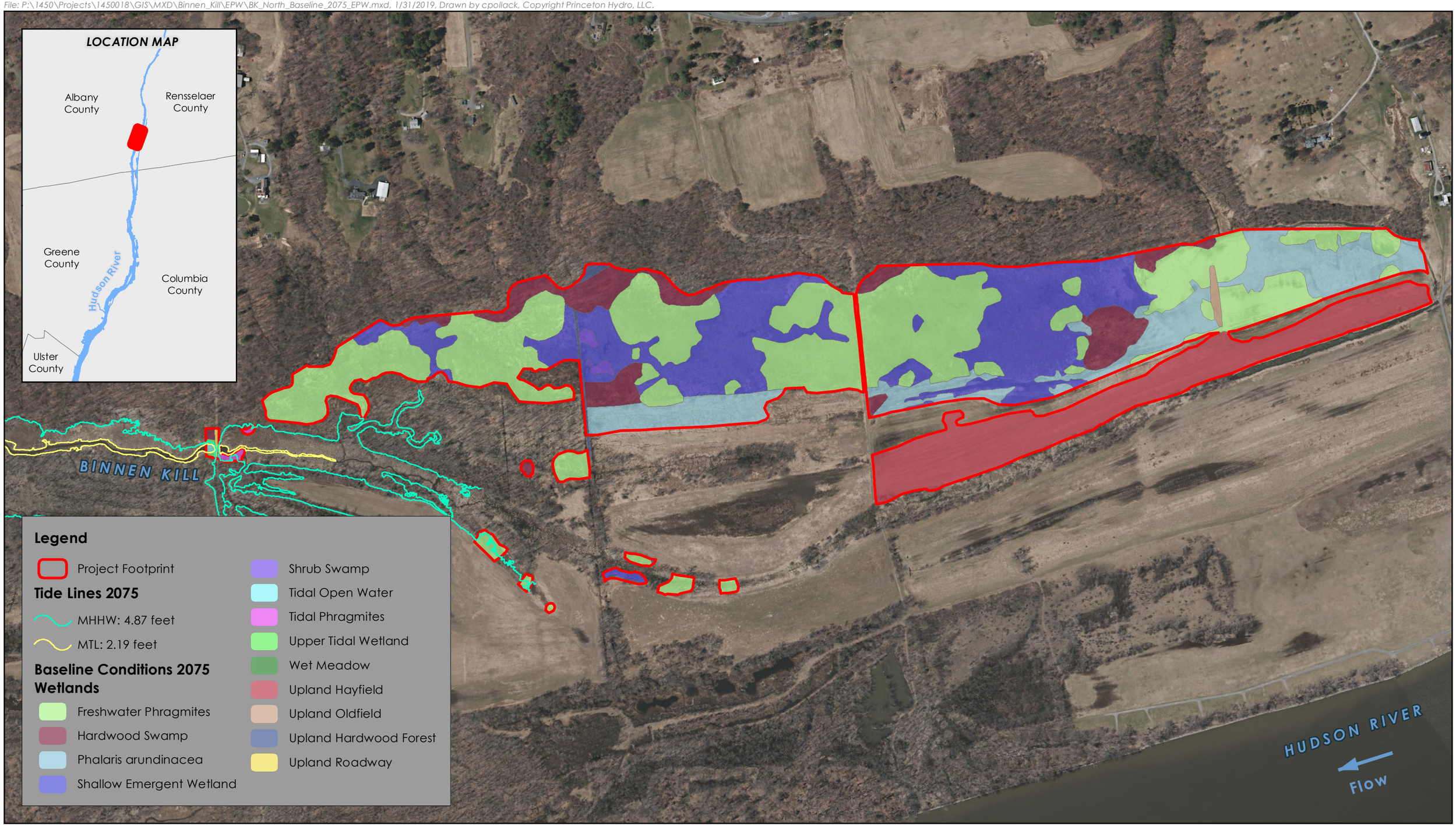
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2018 EPW MAP

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL NORTH
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\EPW\BK_North_Baseline_2075_EPW.mxd, 1/31/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.



BASELINE CONDITIONS 2075 EPW MAP

US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on data obtained from the 2017 Natural Resource Inventory of the Binnen Kill and adjusted for sea level change.
3. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station and adjusted for sea level change. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.

0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL NORTH
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

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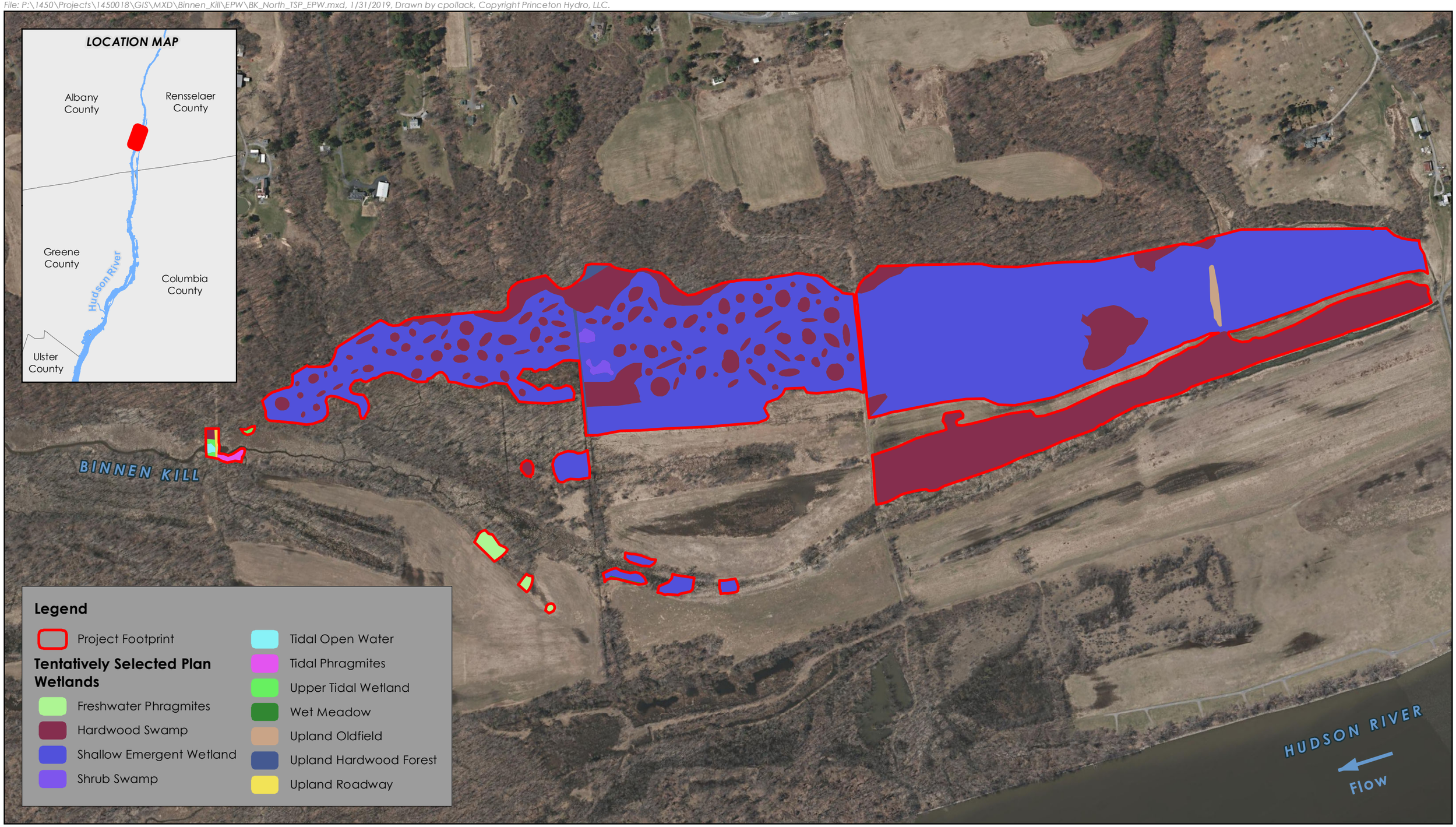

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New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on data obtained from the 2017 Natural Resource Inventory of the Binnen Kill and adjusted for sea level change.
3. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station and adjusted for sea level change. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.

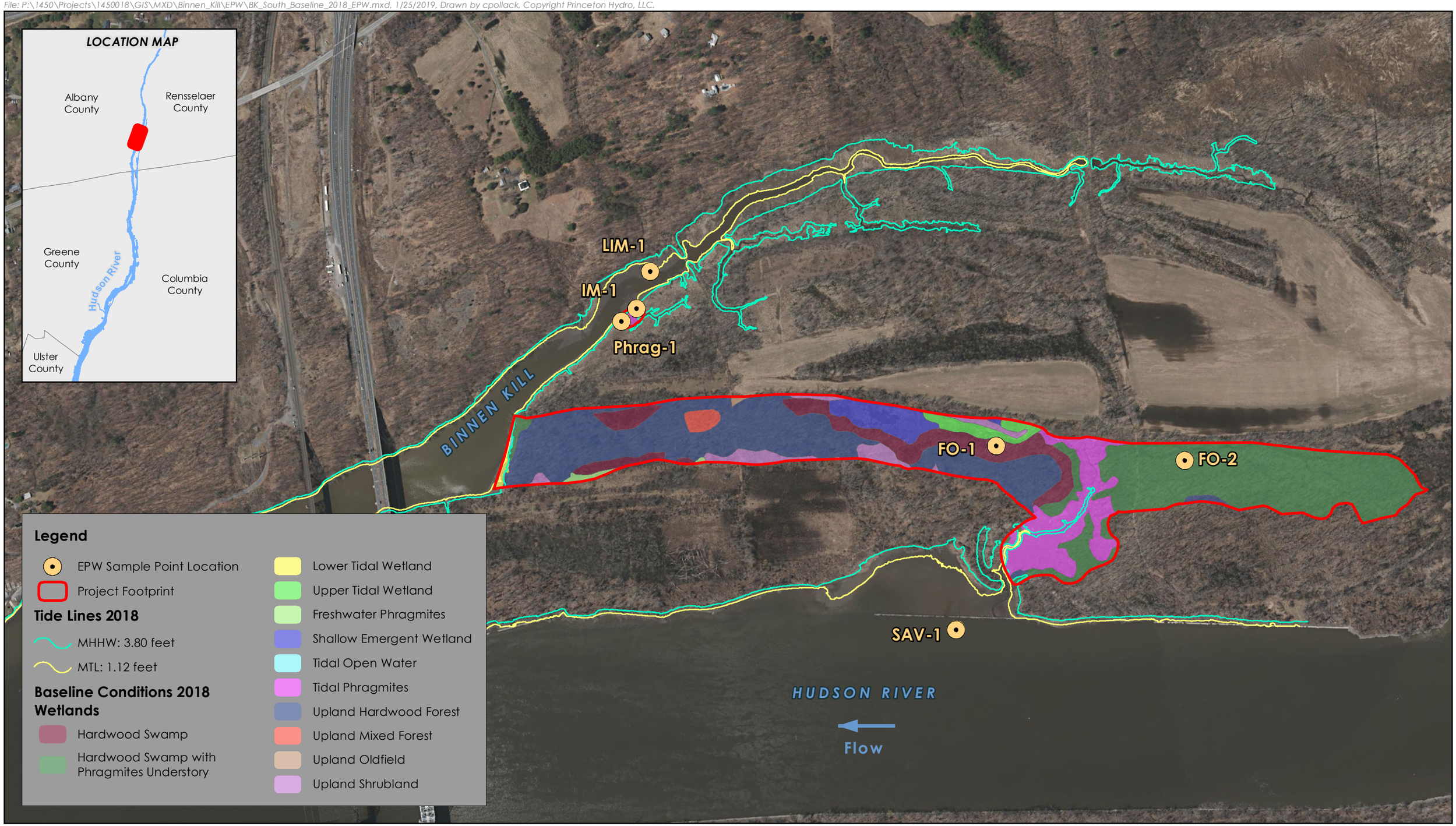
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

TENTATIVELY SELECTED PLAN EPW MAP

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL NORTH
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\EPW\BK_South_Baseline_2018_EPW.mxd, 1/25/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.



US Army Corps of Engineers®
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on data obtained from the 2017 Natural Resource Inventory of the Binnen Kill.
3. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.

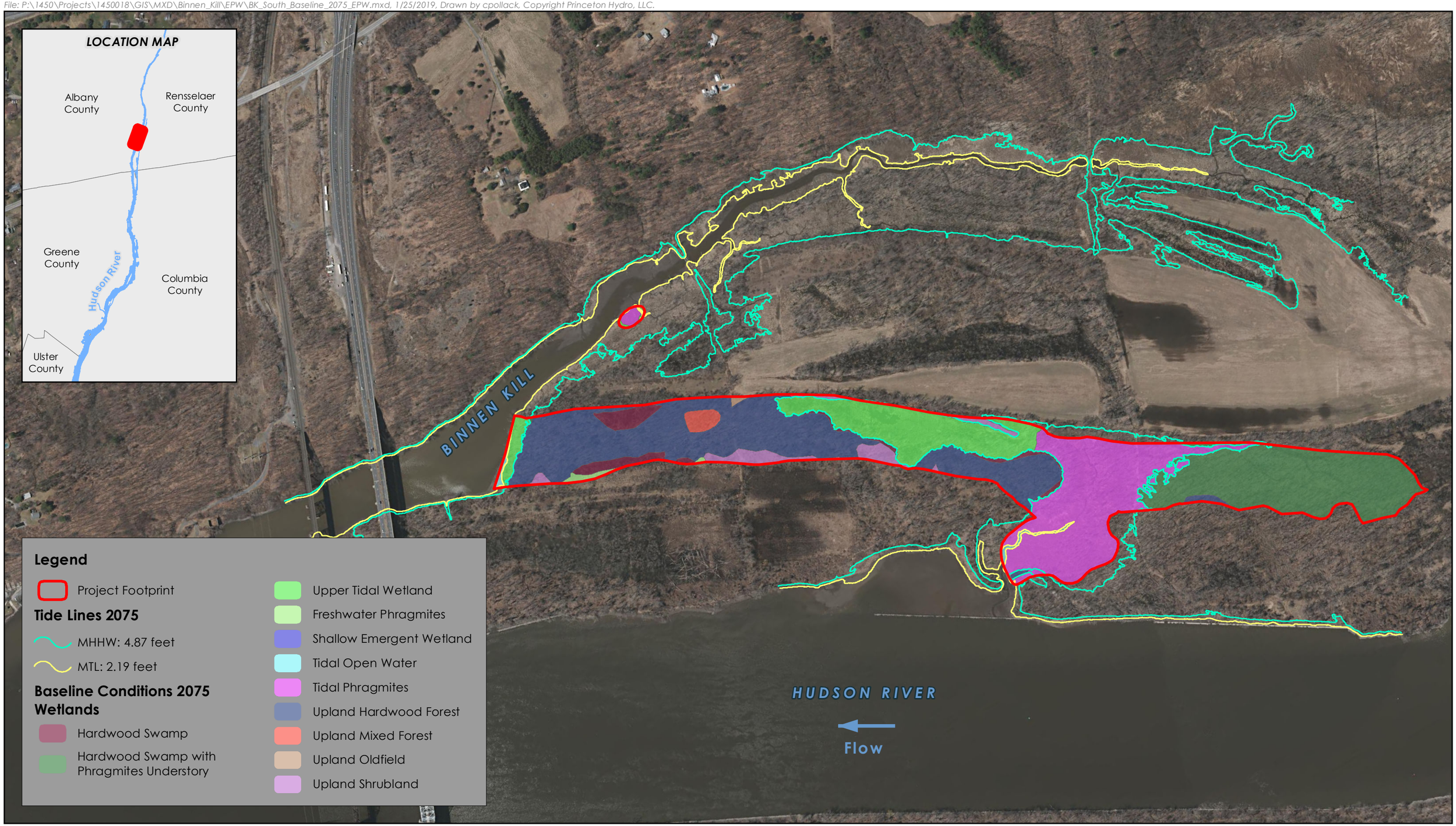
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2018 EPW MAP

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL SOUTH
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\EPW\BK_South_Baseline_2075_EPW.mxd, 1/25/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.



US Army Corps of Engineers®
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on data obtained from the 2017 Natural Resource Inventory of the Binnen Kill and adjusted for sea level change.
3. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station and adjusted for sea level change. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.

0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2075 EPW MAP

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL SOUTH
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\EPW\BK_South_TSP_EPW.mxd, 1/25/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on proposed concept.

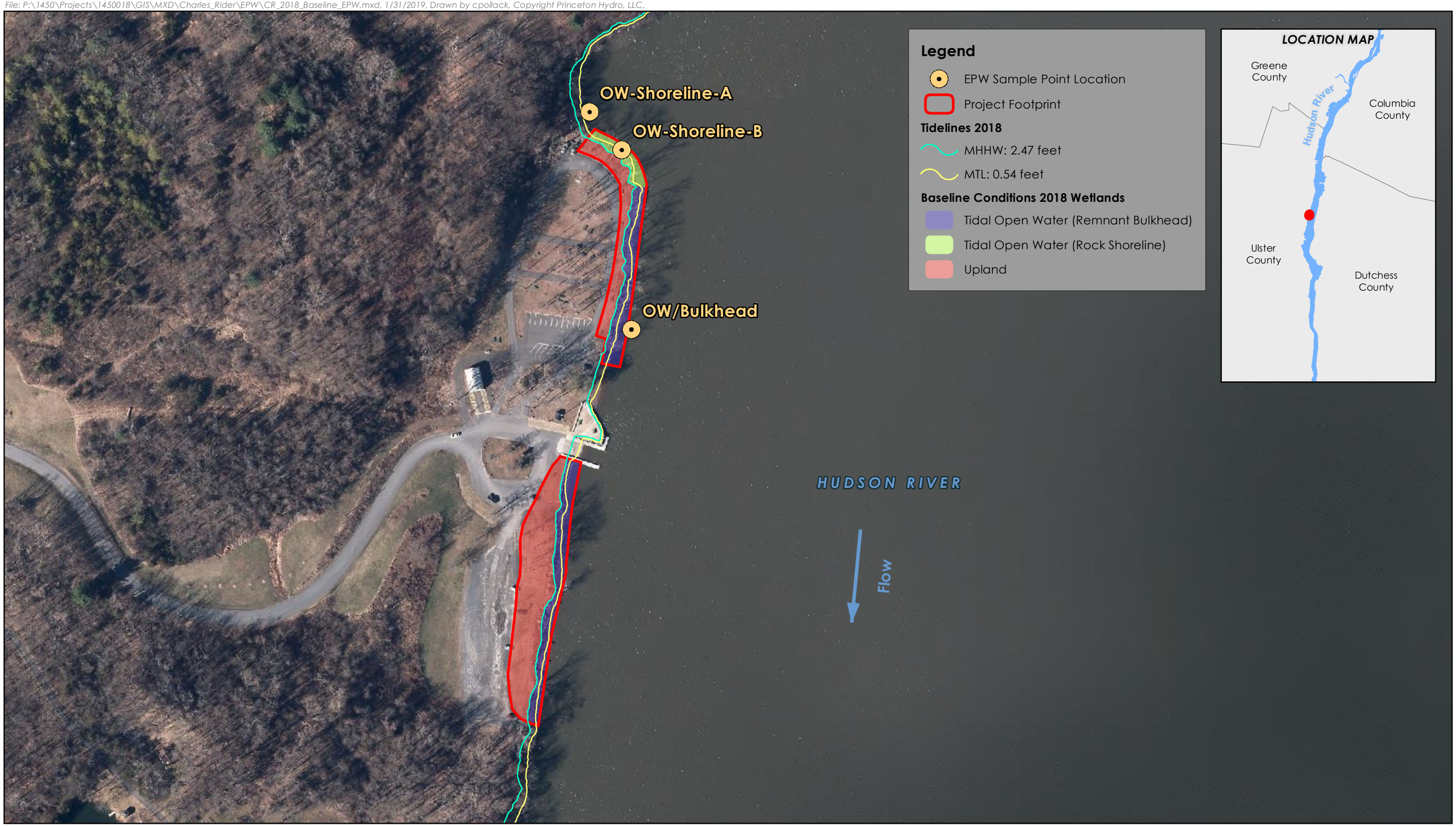
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

TENTATIVELY SELECTED PLAN EPW MAP

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL SOUTH
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Charles_Rider\EPW\CR_2018_Baseline_EPW.mxd, 1/31/2019, Drawn by cpollack. Copyright Princeton Hydro, LLC.



US Army Corps of Engineers®
New York District

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2.. Tide elevations are referenced to NAVD88, feet, and obtained from USGS surface water gage station No. 01372043, Hudson River near Poughkeepsie NY. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.
3. Wetland boundaries based on tide line locations.

0 150 300 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2018 EPW MAP

HUDSON RIVER HABITAT RESTORATION
CHARLES RIDER PARK
TOWN OF ULSTER
ULSTER COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Charles_Rider\EPW\CR_2075_Baseline_EPW.mxd, 1/31/2019, Drawn by cpollack. Copyright Princeton Hydro, LLC.

BASELINE CONDITIONS 2075 EPW MAP

US Army Corps of Engineers
New York District

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Tide elevations are referenced to NAVD88, feet, and obtained from USGS surface water gage station No. 01372043, Hudson River near Poughkeepsie NY and adjusted for sea level change. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.
3. Wetland boundaries based on tide line locations.

0 150 300 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

HUDSON RIVER HABITAT RESTORATION
CHARLES RIDER PARK
TOWN OF ULSTER
ULSTER COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Henry_Hudson\EPW\HH_2018_Baseline_EPW.mxd, 1/31/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.
3. Wetland boundaries based on tide line locations.

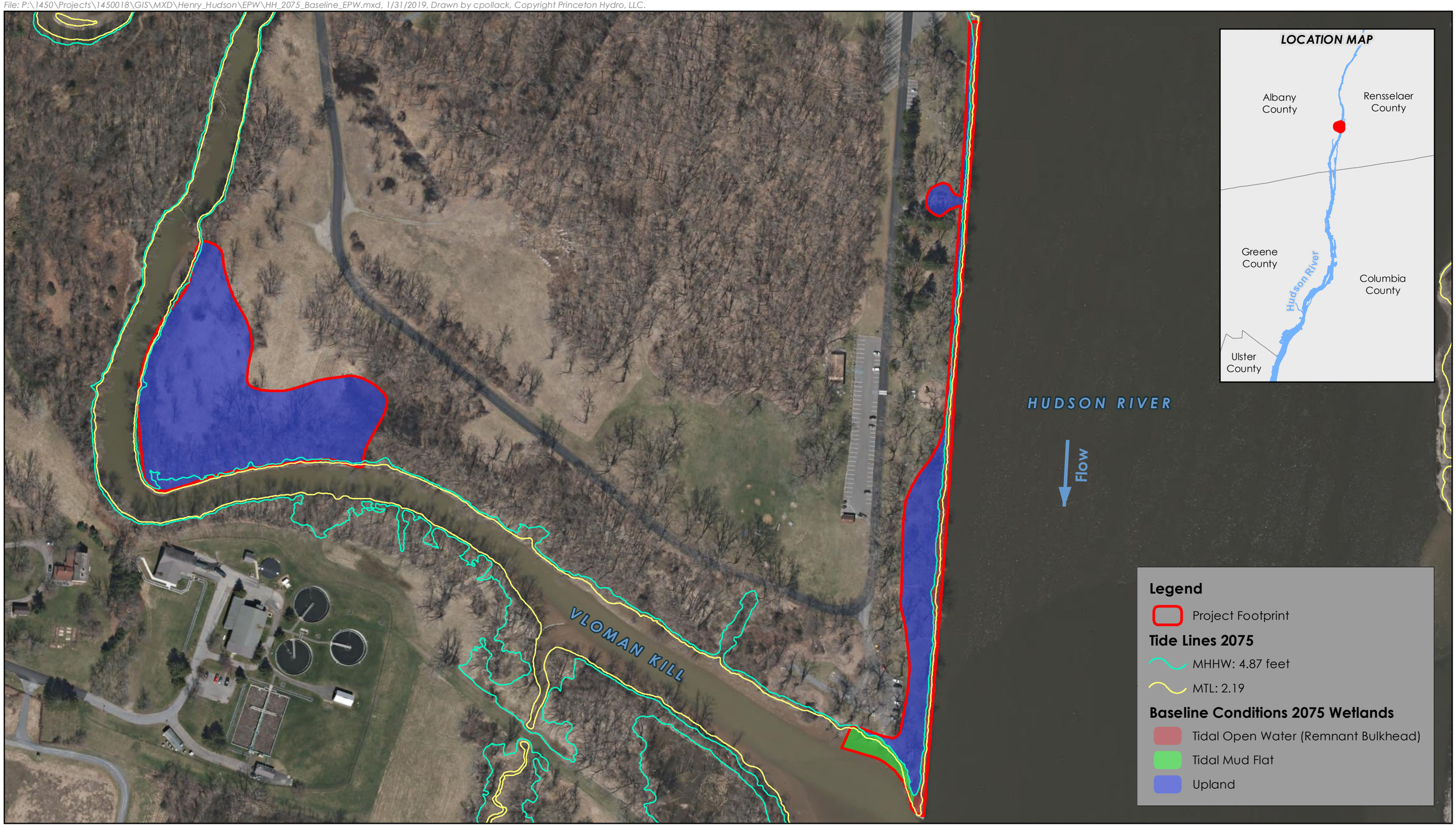
0 200 400 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2018 EPW MAP

HUDSON RIVER HABITAT RESTORATION
HENRY HUDSON PARK
TOWN OF BETHLEHEM
ALBANY COUNTY, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Henry_Hudson\EPW\HH_2075_Baseline_EPW.mxd, 1/31/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.



US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station and adjusted for sea level change. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.
3. Wetland boundaries based on tide line locations.

0 200 400 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2075 EPW MAP

HUDSON RIVER HABITAT RESTORATION
HENRY HUDSON PARK
TOWN OF BETHLEHEM
ALBANY COUNTY, NEW YORK

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US Army Corps of Engineers®
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on proposed concept.

0 200 400 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

TENTATIVELY SELECTED PLAN EPW MAP

HUDSON RIVER HABITAT RESTORATION
HENRY HUDSON PARK
TOWN OF BETHLEHEM
ALBANY COUNTY, NEW YORK

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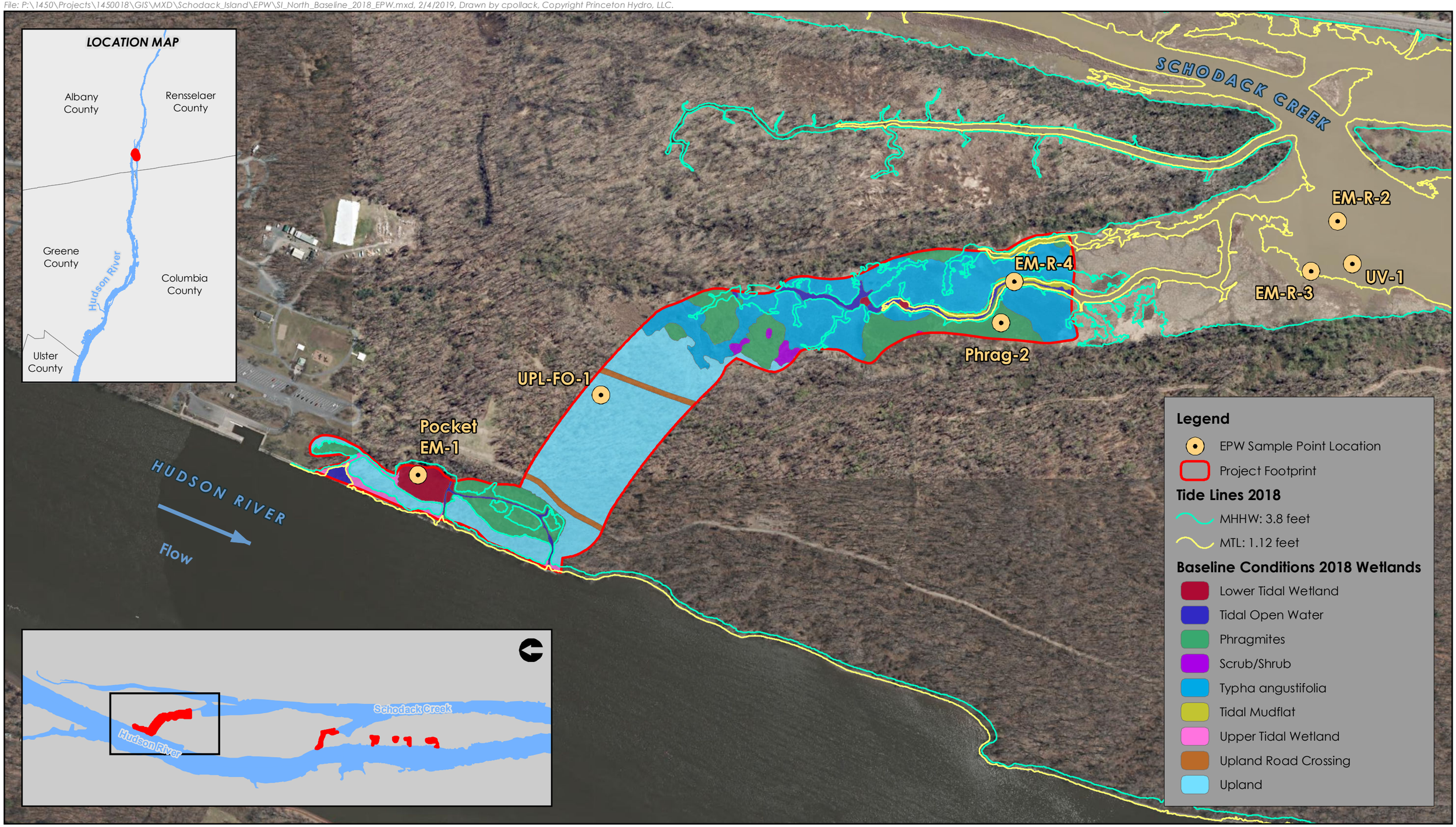

US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on Hudson River Estuary Tidal Wetlands data obtained from the New York State GIS Clearinghouse.
3. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.

0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2018 EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND NORTH
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

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US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on Hudson River Estuary Tidal Wetlands data obtained from the New York State GIS Clearinghouse and adjusted for sea level change.
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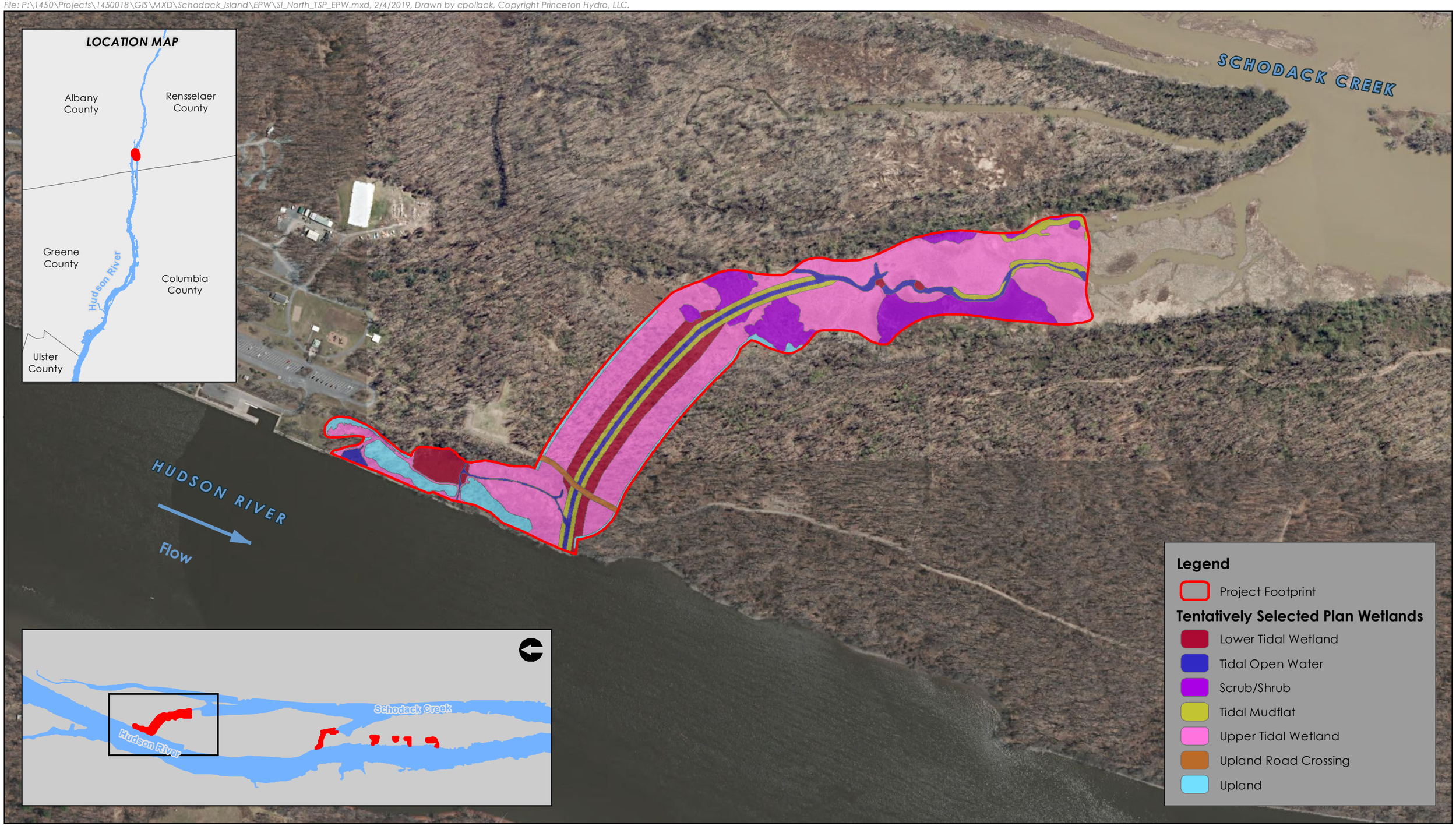
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2075 EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND NORTH
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

File: P:\1450\Projects\1450018\GIS\MXD\Schodack_Island\EPW\SI_North_TSP_EPW.mxd, 2/4/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.



US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on proposed concept.

0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

TENTATIVELY SELECTED PLAN EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND NORTH
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

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US Army Corps of Engineers
New York District

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0 250 500 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2018 EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND POCKET WETLANDS
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

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New York District

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0 250 500 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2075 EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND POCKET WETLANDS
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

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New York District

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1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
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3. Tide elevations are referenced to NAVD88, feet, and obtained from the Hudson River Environmental Conditions Observing System, Schodack Island Station. Tide lines derived using 2011-2012 LiDAR data obtained from from the New York State GIS Clearinghouse.

0 200 400 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2018 EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND SOUTH
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

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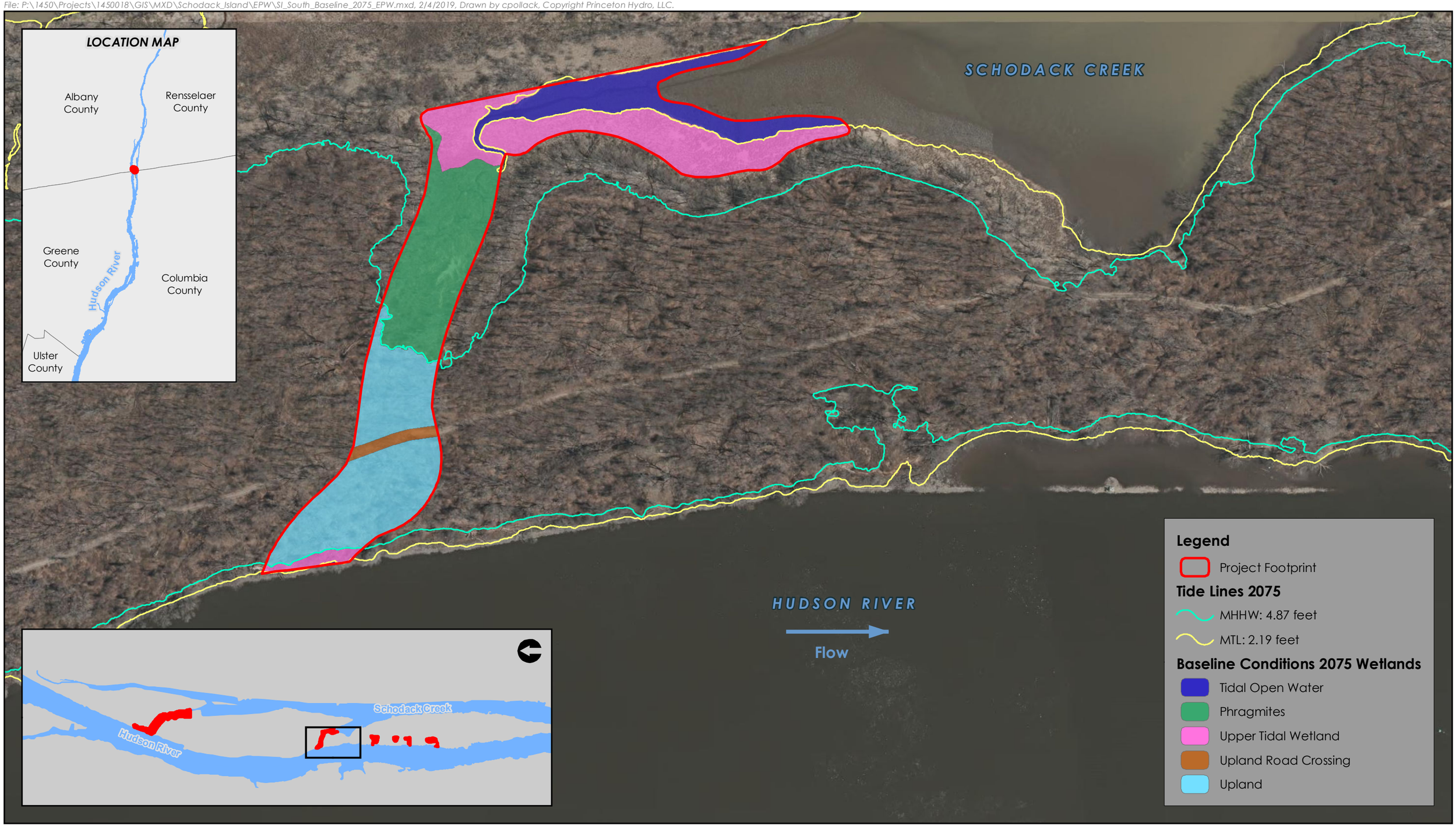

US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
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0 200 400 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

BASELINE CONDITIONS 2075 EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND SOUTH
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

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US Army Corps of Engineers
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on recommended plan.

0 200 400 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

RECOMMENDED PLAN EPW MAP

HUDSON RIVER HABITAT RESTORATION
HENRY HUDSON PARK
TOWN OF BETHLEHEM
ALBANY COUNTY, NEW YORK

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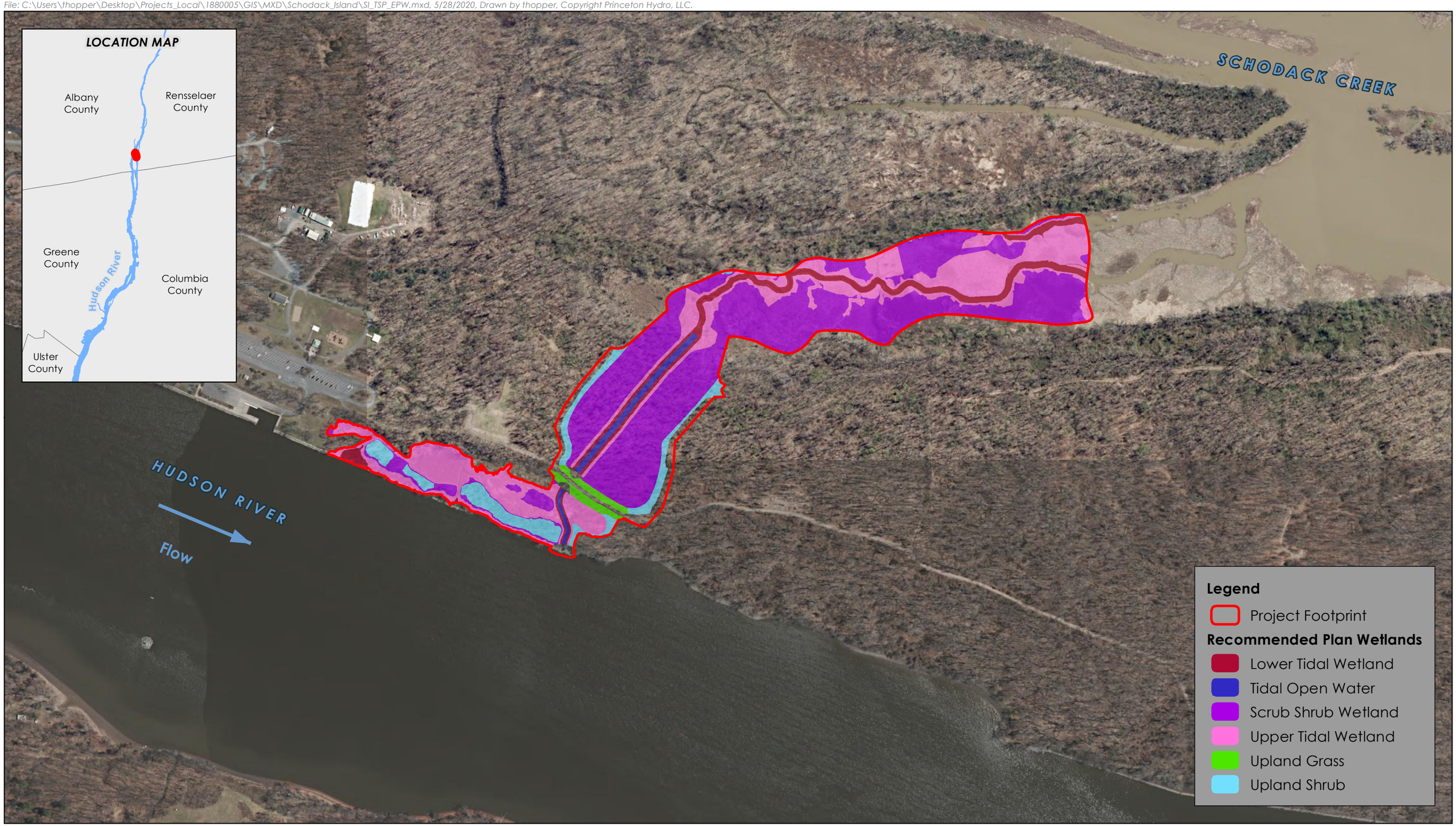

US Army Corps of Engineers®
New York District

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov
2. Wetland boundaries based on recommended plan.

0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

RECOMMENDED PLAN EPW MAP

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK