



**US Army Corps
of Engineers®**

New York District
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ATTN: Regulatory Branch

Special Public Notice

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**Public Notice Announcing the Compensatory Mitigation Guidelines
and Mitigation Checklist For Review of Mitigation Plans
For the U.S. Army Corps of Engineers, New York District**

On December 18, 2003, the U.S. Army Corps of Engineers (USACE) issued a Public Notice announcing the draft Compensatory Mitigation Guidelines and Checklist for the New York District. Comments received during the Public Notice comment period are addressed in the attached "Response to Comments" document. After considerable review, many of the comments and recommendations raised during the comment period were incorporated into the final versions of these documents. As a result, attached are the final "Compensatory Mitigation Guidelines" and "Mitigation Checklist". These documents shall be applied throughout the New York District which encompasses portions of the State of New York and New Jersey (see District Boundary Map, Attachment 3), and shall serve to assist the regulated public in the preparation of compensatory mitigation and monitoring plans and provide information to ensure future compensatory mitigation sites successfully replace the lost functions and values associated with the regulated impacts to waters of the United States.

These documents were developed pursuant to the Regulatory Guidance Letter No. 02-2 (December 2002), the National Wetlands Mitigation Action Plan (December 2002), and the "Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act (CWA) Section 404(b)(1) Guidelines" (May 1990). These documents are available on the Internet at: <http://www.epa.gov/owow/wetlands/guidance>

Questions pertaining to this notice should be directed to James Cannon, who can be contacted by calling (212) 264-0185, or by e-mail at James.H.Cannon@usace.army.mil.

RICHARD L. TOMER
Chief, Regulatory Branch

Attachments

1. Compensatory Mitigation Guidelines
2. Mitigation Checklist
3. New York District Regulatory Boundary Map
4. Response to Comments

Attachment 1
U.S. Army Corps of Engineers, New York District

Regulatory Branch

Compensatory Mitigation Plan Guidelines

INTRODUCTION

Under existing law, the Corps requires compensatory mitigation to replace aquatic resource functions unavoidably lost or adversely affected by authorized activities. The Regulatory Guidance Letter (RGL) No. 02-2 clarifies and supports the national policy for "no overall net loss" of wetlands and reinforces the Corps commitment to protect waters of the United States, including wetlands. Permittees must provide appropriate and practicable mitigation for authorized impacts to aquatic resources in accordance with the laws and regulations. This guidance does not modify existing mitigation policies, regulations, or guidance. The Corps will consider the requirements of other Federal programs when implementing this guidance. It should be noted that the guidelines and the following checklist were developed to improve the overall success of compensatory mitigation with emphasis on a regional watershed approach. It should additionally be noted that these guidelines and checklist should only be used after the sequence of avoidance, minimization, and compensatory mitigation specified by the Section 404(b)(1) Guidelines have been demonstrated. The guidelines and checklist were developed pursuant to the following guidance and can be found at: <http://www.epa.gov/owow/wetlands/guidance>

- Regulatory Guidance Letter No. 02-2 (December 2002)
- The National Wetlands Mitigation Action Plan (December 2002)
- The "Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines" (May 1990).

Applicants should contact the Corps prior to initiation of project planning and mitigation plan development, as mitigation requirements are project-specific. The Corps recommends all applicants hold pre-application meetings with the Corps and other resource agency representatives. During these meetings, the Corps and the resource agencies can evaluate preliminary project designs and discuss mitigation opportunities. It is recommended that the applicant should not purchase sites or finalize plans before the Corps has reviewed and approved of the compensatory mitigation concept. Applicants should also ensure that the mitigation plan is developed in accordance with the most recent Corps checklist. However, the checklist is a guidance document, not policy. This document and the associated checklist are for use when the Corps determines that mitigation is necessary to offset the impacts to the aquatic environment that would result from a proposed project. All permit applications, including Nationwide Permit pre-construction notifications, that include mitigation proposals, should address these guidelines with as much detail as possible in order to enable an adequate review and evaluation.

The checklist is to identify the types and extent of information that agency personnel need to assess the likelihood of success of a mitigation proposal. The checklist provides a basic framework that will improve predictability and consistency in the development of mitigation plans for permit applicants. It should be noted that the level of information submitted for review would be dependent upon the scale of the mitigation project.

The purpose of this guidance is twofold:

- To provide guidance to the regulated community on the requirements for mitigation required by the Corps of Engineers, New York District.
- To provide a standardized format for Corps use in reviewing mitigation plans and their technical merit.

It is important to note that there is flexibility in the document. When modifications are needed, the plan should so state and explain the rationale. The Corps acknowledges that absolutes are rare in mitigation design and that a successful site requires careful design and review as well as common sense oversight during construction and monitoring by a person well versed in wetland science.

Please refer to the U.S. Army Corps of Engineers New York District Regulatory website at <http://www.nan.usace.army.mil> for updated information on mitigation guidance. As new guidance information becomes available it will be posted on this site.

BASIC REQUIREMENTS FOR SUCCESS

The following NRC guidelines listed below should be considered as basic requirements for mitigation success (Taken from Operational Guidelines for Creating or Restoring Self-Sustaining Wetlands, National Research Council "Compensating for Wetlands Losses Under the Clean Water Act," June 2001 (Chapter 7, pp. 123-128). The specific guidance for these sections have been incorporated into these mitigation guidelines.

1. Consider the hydrogeomorphic and ecological landscape and climate.
2. Adopt a dynamic landscape perspective.
3. Restore or develop naturally variable hydrological conditions.
4. Whenever possible, choose wetland restoration over creation.
5. Avoid over-engineered structures in the wetland's design.
6. Pay particular attention to appropriate planting elevation, depth, soil type, and seasonal timing.
7. Provide appropriately heterogeneous topography.
8. Pay attention to subsurface conditions, including soil and sediment geochemistry and physics, groundwater quantity and quality, and infaunal communities.
9. Consider complications associated with creation or restoration in seriously degraded or disturbed sites.
10. Conduct early monitoring as part of adaptive management.

Consider the hydrogeomorphic and ecological landscape and climate. Whenever possible locate the mitigation site in a setting of comparable landscape position and hydrogeomorphic class. Do not generate atypical “hydrogeomorphic hybrids”; instead, duplicate the features of reference wetlands or enhance connectivity with natural upland landscape elements (Gwin et al. 1999).

Provide a landscape setting characterization of both the wetland to be developed and, using comparable descriptors, the proposed mitigation site. Consider conducting a cumulative impact analysis at the landscape level based on templates for wetland development (Bedford 1999). Landscapes have natural patterns that maximize the value and function of individual habitats. For example, isolated wetlands function in ways that are quite different from wetlands adjacent to rivers. A forested wetland island, created in an otherwise grassy or agricultural landscape, will support species that are different from those in a forested wetland in a large forest tract. For wildlife and fisheries enhancement, determine if the wetland site is along ecological corridors such as migratory flyways or spawning runs. Constraints also include landscape factors. Shoreline and coastal wetlands adjacent to heavy wave action have historically high erosion rates or highly erodible soils, and often-heavy boat wakes. Placement of wetlands in these locations may require shoreline armoring and other protective engineered structures that are contrary to the mitigation goals and at cross-purposes to the desired functions. Even though catastrophic events cannot be prevented, a fundamental factor in mitigation plan design should be how well the site will respond to natural disturbances that are likely to occur. Floods, droughts, muskrats, geese, and storms could be expected natural disturbances and should be accommodated in mitigation designs. Natural ecosystems generally recover rapidly from natural disturbances to which they are adapted. The design should aim to restore a series of natural processes at the mitigation sites to ensure that resilience will have been achieved.

Adopt a dynamic landscape perspective. Consider both current and future watershed hydrology and wetland location. Take into account surrounding land use and future plans for the land. Select sites that are, and will continue to be, resistant to disturbance from the surrounding landscape, such as preserving large buffers and connectivity to other wetlands. Build on existing wetland and upland systems. If possible, locate the mitigation site to take advantage of refuges, buffers, green spaces, and other preserved elements of the landscape. Design a system that utilizes natural processes and energies, such as the potential energy of streams as natural subsidies to the system. Flooding rivers and tides transport great quantities of water, nutrients, and organic matter in relatively short time periods, subsidizing the wetlands open to these flows as well as the adjacent rivers, lakes, and estuaries.

Whenever possible, choose wetland restoration over establishment. Select sites where wetlands previously existed or where nearby wetlands still exist. Restoration of wetlands has been observed to be more feasible and sustainable than establishment of wetlands. In restored sites the proper substrate may be present, seed sources may be on-site or nearby, and the appropriate hydrological conditions may exist or may be more easily restored. The U.S. Army Corps of Engineers (Corps) and Environmental Protection Agency (EPA) Mitigation Memorandum of Agreement states that, “because the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, restoration should be the first option considered” (Fed. Regist. 60(Nov. 28):58605). Avoid over-engineered structures in the wetland's design. Design the system

for minimal maintenance. Set initial conditions and let the system develop. Natural systems should be planned to accommodate biological systems. The system of plants, animals, microbes, substrate, and water flows should be developed for self-maintenance and self-design. Whenever possible, avoid manipulating wetland processes using approaches that require continual maintenance. Avoid hydraulic control structures and other engineered structures that are vulnerable to chronic failure and require maintenance and replacement. If necessary to design in structures, such as to prevent erosion until the wetland has developed soil stability, do so using natural features, such as coarse woody debris. Be aware that more specific habitat designs and planting will be required where federal or state listed species are among the specific restoration targets.

Consider complications associated with establishment or restoration in seriously degraded or disturbed sites. A seriously degraded wetland, surrounded by an extensively developed landscape, may achieve its maximal function only as an impaired system that requires active management to support natural processes and native species (NRC 1992). It should be recognized, however, that the functional performance of some degraded sites may be optimized by mitigation, and these considerations should be included if the goal of the mitigation is water- or sediment-quality improvement, promotion of rare or endangered species, or other objectives best served by locating a wetland in a disturbed landscape position. Disturbance that is intense, unnatural, or rare can promote the colonization of invasive species or at least delay the natural rates of redevelopment. Reintroducing natural hydrology with minimal excavation of soils often promotes alternative pathways of wetland development. It is often advantageous to preserve the integrity of native soils and to avoid deep grading of substrates that may destroy natural belowground processes and facilitate invasive species colonization (Zedler 1996).

DEFINITIONS

These definitions were developed for use with this document.

Buffers: Buffers typically consist of native plant communities (i.e., indigenous species) that reflect the local landscape and ecology. Conservation buffers are best described as strips or other areas of land in permanent vegetation that separate wetlands or other aquatic resources from developed areas. Buffers enhance or provide a variety of aquatic habitat functions including habitat for wildlife and other organisms, runoff filtration, moderation of water temperature changes, and detritus for aquatic food webs.

Compensatory Mitigation: Final step in the mitigation sequencing process to offset the loss of wetland or other aquatic resources if adverse impacts remain after avoidance and minimization.

Functional Assessment: Functional scores are determined by using aquatic site assessment techniques generally accepted by experts in the field or the best professional judgment of Federal, Tribal, and state agency representatives, fully considering ecological functions included in the 404(b)(1) Guidelines, e.g., Hydrogeomorphic Assessment or Wetland Rapid Assessment Procedures.

Functional Replacement: For aquatic resources, the objective is to provide, at a minimum, no net loss of functions, with an adequate margin of safety to reflect anticipated success.

In-Lieu-Fee: In-lieu-fee mitigation occurs in circumstances where a permittee provides funds to an in-lieu-fee sponsor instead of or in addition to either completing project specific mitigation or purchasing credits from a mitigation bank approved under the Banking Guidance.

Invasive species: A species that often aggressively colonize areas, and compete with and displace locally adapted native plant communities, with adverse ecological results.

Mitigation: Avoiding, minimizing, rectifying, reducing or compensating for resource losses.

Mitigation Bank: A site where wetlands and or other aquatic resources are restored, created or enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources.

Native (Indigenous) species: With respect to a particular ecosystem, a species that historically occurred or currently occurs in that ecosystem, other than as a result of an introduction.

Practicable: Available and capable of being implemented after taking into account availability of suitable locations, constructability, overall costs, technical requirements, and logistics.

Preservation: A course of action to remove a threat to aquatic resources. Examples include the purchase of land or protection of mitigation sites (with buffers) to be set aside for conservation and protected in perpetuity. Protection usually occurs by means of deed restriction, easements or donation to a land conservancy organization.

Watershed Approach: Mitigation plans should describe how the site chosen for a mitigation project contributes to the specific aquatic resource needs of the impacted watershed. A watershed-based approach to aquatic resource protection considers entire systems and their constituent parts and relies on coordination with regional entities involved with local planning and public interest issues. Good watershed planning helps to sustain the watershed services that communities stand to lose as they grow – water quality, stormwater management, flood retention and habitat for plants and animals. More information on watershed approaches for development and mitigation is available at www.epa.gov/owow/watershed, and the Center for Watershed Protection at www.cwp.org.

Wetlands: Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted typically for life in saturated soil conditions. The 1987 *Corps of Engineers Wetlands Delineation Manual* (the 1987 Manual) is the current Federal delineation manual used in the Clean Water Act Section 404 regulatory program for the identification and delineation of wetlands.

Wetlands Enhancement: A course of action to add or improve one or more functions to an existing wetland. An *existing wetland* would meet the criteria for a wetland in accordance with the 1987 Manual.

Wetlands Establishment (Creation): A course of action to convert a persistent upland or open water area into a wetland at a site where a wetland did not previously exist.

Wetlands Restoration: A course of action to return a former wetland to a federally regulated wetland. A *former wetland* would not meet the criteria for a wetland in accordance with the 1987 Manual due to its disturbed or altered condition.

NOTE: The following outline is to be used in conjunction with the USACE New York District Compensatory Mitigation Plan Checklist.

A. MITIGATION JUSTIFICATION

Prior to the development of a mitigation plan, and in accordance with the Section 404(b)(1) Guidelines, the applicant must demonstrate avoidance and minimization of aquatic resource impacts prior to proposing compensatory mitigation. If an applicant is required to notify the Corps regarding authorization under an existing General Permit, it is likely that the Corps' verification letter/notice to proceed will require compensatory mitigation. Clearly, the sequence of avoidance, minimization, and compensatory mitigation specified by the Section 404(b)(1) Guidelines and the Mitigation MOA is fundamental to the administration of the Corps' regulatory program. A discussion of mitigation sequencing efforts should be included as part of the mitigation plan.

Mitigation Banking

Mitigation banking involves a formal administrative framework in which aquatic resources are restored, enhanced, or established, expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources. Banking is characterized by transfer of the legal and financial responsibility for executing compensatory mitigation from the permittee to a third party—the bank sponsor.

Established site acres for wetland compensation are quantified as “credits” which are available for use by the bank sponsor or by other parties to compensate for adverse wetland impacts from permitted activities (i.e. “debits”).

Requirements for compensatory mitigation may be satisfied using mitigation banks only when on-site compensation is not practicable or when use of mitigation banks is environmentally preferable. Prospective bank sponsors should not construe or anticipate participation in the establishment of a mitigation bank as ultimate authorization for specific projects, as exempting such projects from any applicable requirements or as pre-authorizing the use of credits from that bank for any particular project.

For more information on using an existing mitigation bank or developing a new bank, see your local Corps representatives, and review the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, which is published in the Federal Register dated November 28, 1995 (Volume 60, Number 228), pages 58605 – 58614. This document can be downloaded over the internet at: <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/mitbankn.htm>

In Lieu Fee

“In-lieu-fee” mitigation occurs in circumstances where a permittee provides funds to an in-lieu-fee sponsor instead of either completing project-specific mitigation or purchasing credits from a mitigation bank approved under the Banking Guidance.

As indicated in RGL No. 02-2, compensatory mitigation involving in-lieu fee arrangements should follow the existing in-lieu fee guidance as prescribed in the Federal Register dated November 7, 2000 (65 FR 66914).

B. MITIGATION GOALS AND OBJECTIVES

Compensatory mitigation plans should discuss environmental goals and objectives, the aquatic resource type(s) and functions that will be impacted by the authorized work, and the aquatic resource type(s) and functions proposed at the compensatory mitigation site(s). These goals should be discussed early in the planning process as they will drive site selection and design of the mitigation. Included with a mitigation plan should be a broad statement of what is intended to be accomplished through the mitigation project. The goal statement should include a list of the major wetland functions and values to be achieved as well as the amount, i.e., acres, linear feet, or functional changes, of aquatic habitat that the authorized work will impact and the amount of compensatory mitigation needed to offset those impacts, by aquatic resource type. Generally, the mitigation should provide, at a minimum, 1:1 functional replacement, i.e., no net loss of functions, with an adequate margin of safety to reflect anticipated success.

The Corps typically requires construction of compensatory mitigation to occur prior to or concurrent with the authorized impacts. Applicants should be aware that, when compensation occurs after project commencement (as opposed to advanced mitigation), additional compensation would typically be required to offset temporal losses. Temporal losses occur because of the passage of time between when wetland functions have been lost to the project impact and when they are developed in a compensatory wetland. The amount will depend upon the nature of the wetland proposed and the functions intended. Such compensation may include increased ratios for wetland establishment, restoration, enhancement, or additional preservation.

Mitigation goals and objectives can be supported by information on reference wetlands. Reference wetlands can represent a particular site for which a profile has been developed, or they can represent a population of sites that exhibit a range of variation within a particular functional type. Reference wetlands should be sites similar to the impact areas, which have been tested, measured, and related to corresponding ecosystem functions. The reference wetland's baseline information, such as required by the baseline information section below, will need to be collected for comparison purposes with the established, enhanced, or restored wetlands.

C. PERFORMANCE STANDARDS

Mitigation goals and objectives require multiple corresponding performance/success standards. The established performance standards should be observable or measurable attributes that

can be used to determine whether or not the mitigation site is successfully meeting the stated goals and objectives, and should be included in the proposal.

Performance standards are codified by Special Conditions in the permit and are typically, but are not limited to, quantifiable measures including hydrologic, vegetative, faunal, and soil factors.

D. MITIGATION SITE SELECTION

Generally, mitigation sites should be contiguous with or bordering existing waters of the United States and, when practicable, adjacent or contiguous to the discharge site (on-site compensatory mitigation). On-site mitigation generally compensates for locally important functions, e.g., flood control and wildlife habitat. However, off-site mitigation may be used when there is no practicable opportunity for on-site mitigation, or when off-site mitigation provides more watershed benefit than on-site mitigation. The conversion of high quality uplands to wetlands for the placement of a mitigation site is discouraged.

According to Regulatory Guidance Letter No. 02-2, there are several items, which should be considered when determining if a potential mitigation site is appropriate. When reporting on why sites were or were not selected, the following should be addressed:

- Availability of suitable sites
- Feasibility of construction
- Overall costs
- Technical Requirements
- Logistics
- Likelihood for success
- Ecological sustainability
- Practicability for long-term monitoring and maintenance

E. BASELINE INFORMATION

The following outlines information that will be required for both the impact and mitigation site(s).

The USACE Waterways Experiment Station document, Wetlands Research Program Technical Report Y-87-1 Wetland Delineation Manual, January 1987, contains information on identifying and delineating wetlands, including hydrology, vegetation and soils sampling methods and criteria. <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/techbio.htm>

Location

Typically, site location maps would include tax maps and copies of USGS topographic quadrangle maps. To standardize reporting, the watershed(s), as identified using a USGS Hydrologic Unit Code(s) for each mitigation site is required (See Checklist). These codes can be

determined using an EPA website: <http://cfpub.epa.gov/surf/locate/index.cfm>. Other agency jurisdiction maps relevant to the impact/mitigation site (e.g., Adirondack Park Agency, NYS Department of Environmental Conservation, Hudson River-Black River Regulating District), if available, should also be obtained.

General Site Information

Information regarding existing aquatic resource conditions that exist on a site should be provided and include areas of flooding, water quality, habitat type, State or Federally listed species use, and their critical habitats, and other overall watershed and regional functions. Unusual ecological communities, existing and surrounding land use (e.g., recreational, industrial, agricultural), and presence or proximity to cultural or historic resources.

Included with the general site information should be a detailed work description of all of the proposed temporary and permanent impacts to waters of the United States. This should be depicted on a delineation map with all impacts clearly shown and quantified in cubic yards, acreage, or linear feet, as appropriate. A narrative discussion of the impacts should also be provided in the form of descriptions and information on the proposed lost or impacted aquatic resource functions. The assessment of impacts should include all cumulative impacts (i.e., associated with the entire project, direct as well as indirect, and any reasonably foreseeable future impacts that might occur as a result of the project). Furthermore, any potential impacts to State or Federally listed species, cultural resource information and impacts to other sensitive or locally important upland areas should be described.

Classification and Functional Assessment

As part of the Watershed Approach and to assist regulators in the public interest review during the permitting process, an adequate assessment of the current functions and values of the impact site and mitigation site is beneficial. The ability to identify and determine the relative importance of the specific functions and values of the sites will ultimately define the goals and objectives in the development of the mitigation site. The Corps is currently in the process of evaluating various wetland functional assessments in consultation with the resource agencies.

Existing Hydrology

Information on the existing hydrologic conditions of both the impact site and proposed mitigation site should include a delineation map showing the locations and boundaries of all waters of the United States, including wetlands, and which also quantifies the areal extent (in acreages) of all ponds, lakes and wetlands, and the lengths and widths (in feet) of all rivers and streams. If the waters extend off-site, this should also be indicated. In addition, inflows, outflows, volumes, velocity, hydroperiod, floodplain limits, and water quality characteristics of the different aquatic resources should be described. In tidal waters, the plane of spring high tide should be shown, and in non-tidal streams and rivers, the ordinary high water mark should be shown. These data are frequently identified for larger streams and may be available through the USGS, NYSDEC, or the Corps.

Existing Dominant Vegetation

Vegetation stratification/structure

A description (i.e., number of layers and percent cover as opposed to relative cover) of all existing vegetation layers, including overstory, subcanopy, ground cover, vines, and general ages of vegetative communities.

Indicator status

The indicator status of a plant species is the range of estimated probabilities (expressed as a frequency of occurrence) of a species occurring in a wetland versus non-wetland. Indicator Status can be found in National List of Plant Species That Occur in Wetlands: Northeast (Region 1), published by the U.S. Fish and Wildlife Service. USFWS Biological Report 88(26.1) May 1988. It is located at: <http://www.nwi.fws.gov/bha/lists.html>

Native/non-native/invasive status

Provide information regarding native, non-native, and invasive species status. More information on what is considered an invasive plant in New York State can be found through the Invasive Plant Council of New York State (www.ipcnys.org) or the Adirondack Park Invasive Plant Program (www.adkinvasives.com). Information on native/non-native status is available at the NRCS website at : http://plants.usda.gov/cgi_bin/topics.cgi?earl=noxious.cgi. To find additional information regarding invasive plant species in New Jersey contact the U.S. Fish and Wildlife Service field office in Pleasantville, New Jersey at (609) 646-9310.

Existing Soils

Information on subsurface conditions, including soil and sediment geochemistry and physics, groundwater quantity and quality, and infaunal communities should be provided. Inspect and characterize the soils in some detail to determine their permeability, texture, and stratigraphy. Highly permeable soils are not likely to support a wetland unless water inflow rates or water tables are high. Characterize the general chemical structure and variability of soils, surface water, groundwater, and tides. For a potential mitigation site, if a wetland is being created or restored primarily for wildlife enhancement, chemicals in the soil and water may be significant, either for wetland productivity or bioaccumulation of toxic materials. At a minimum, these should include chemical attributes that control critical geochemical or biological processes, such as pH, redox, nutrients (nitrogen and phosphorus species), organic content and suspended matter.

Information pertaining to soil profile, classification, series, structure, texture, organic content, permeability, and fill sites (i.e prior converted croplands) can be obtained by examining County Soil Surveys or visiting the local NRCS office, and the County Soil and Water Conservation Districts. Additional information can be obtained at <http://soils.usda.gov>.

Contaminants

For common contaminants and means of measuring, see <http://www.dec.state.ny.us> and <http://www.state.nj.us/dep>. Sites may contain pollutants within the soil or water profile and these sites could be regulated under RCRA (Resource Conservation Recovery Act) or CERCLA (the Superfund legislation), which are EPA-defined terms. Refer to <http://www.epa.gov> for guidance. Applicants should describe any required remedial activities prior to implementing the mitigation plan.

F. MITIGATION WORK PLAN

For technical guidance on wetland construction, please refer to Wetlands Engineering Handbook, ERDC/EL TR-WRP-RE-21, March 2000, U.S. Army Engineer Research and Development Center, Vicksburg, MS: <http://www.wes.army.mil/el/wetlands/pdfs/wrpre21/wrpre21.pdf>

Construction

A timeline of the construction process starting with the placement of erosion and sediment controls and ending with the removal of said controls needs to be submitted. All phases of the construction of the mitigation project need to be included. It is generally recommended, and may require, that an environmental monitor, knowledgeable in wetland mitigation issues, oversee the construction. A qualified monitor would be useful to identify potential problems and recommend solutions during the construction phase, which can significantly increase the likelihood of mitigation success. Over the life of the monitoring period, this can save project sponsors from having to perform expensive remediation activities such as regrading and replanting.

Planned Hydrology

This section of the Guidelines focuses on establishing appropriate hydrology within wetland mitigation sites. It is recommended that the compensatory mitigation site promote naturally variable hydrology, with emphasis on enabling fluctuations in water flow and level, and duration and frequency of change, representative of other comparable wetlands in the same landscape setting. Preferably, natural hydrology should be allowed to become reestablished rather than finessed through active engineering devices to mimic a natural hydroperiod. When restoration is not an option, favor the use of passive devices that have a higher likelihood to sustain the desired hydroperiod over long term. Try to avoid designing a system dependent on water-control structures, irrigation systems, or other artificial infrastructure that must be maintained in perpetuity in order for wetland hydrology to meet the specified design. In situations where direct (in-kind) replacement is desired, candidate mitigation sites should have the same basic hydrological attributes as the impacted site. Hydrology should be inspected during flood seasons and heavy rains, and the annual and extreme event flooding histories of the site should be reviewed as closely as possible. A detailed hydrological study of the site should be undertaken, including a determination of the potential interaction of groundwater with the proposed wetland. Without flooding or saturated soils, for at least part of the growing season, a wetland will not develop. Similarly, a site that is too wet

will not support the desired biodiversity. The tidal cycle and stages are important to the hydrology of coastal wetlands.

Provide appropriately heterogeneous topography. The need to promote specific hydroperiods to support specific wetland plants and animals means that appropriate elevations and topographic variations must be present in restoration and establishment sites. Slight differences in topography (e.g., micro- and meso-scale variations and presence and absence of drainage connections) can alter the timing, frequency, amplitude, and duration of inundation. Plan for elevations that are appropriate to plant and animal communities that are reflected in adjacent or close-by natural systems. In tidal systems, be aware of local variations in tidal flooding regime (e.g., due to freshwater flow and local controls on circulation) that might affect flooding duration and frequency.

The influencing factors of hydrology include precipitation, stratigraphy, topography, soil permeability, plant cover, drainage area, and location within the watershed. These parameters must be fully understood on an existing site for the construction and establishment of a wetland to succeed. A detailed analysis of a proposed site's hydrologic regime is required to determine if wetland establishment is feasible.

If it is determined that a wetland can be located in the subject location, the mitigation design (configuration, planting, and grading) should be driven by the results of detailed hydrologic analyses. For example, a diverse emergent plant community is more likely to develop and succeed in a hydrologic regime that allows for normal fluctuations of the water table both seasonally and during storm events. Factors such as longer, deeper flooding events can result in higher plant stress. Few wetland species can survive longer inundation and monotypic stands can occur. Conversely, few wetland species can compete with species more adapted for uplands that will typically colonize a site without a properly designed hydrologic regime. Understanding a site's hydrology, water budget, and hydroperiod before the specific configuration and design is crucial to mitigation success.

Several analysis methods are recommended to determine a site's hydrological characteristics. A water budget, an equation of inputs and outputs (precipitation, surface runoff into and out of the site, evapotranspiration, groundwater movement into and out of the site), should be developed for the proposed mitigation site. The hydroperiod, information regarding seasonal depth, duration, and timing of inundation, should also be submitted. Methods can be as simple as using data from monitoring wells, existing stream gauges, and the rational method, or by using a watershed-modeling program such as HEC-1 or TR-20. A full hydrologic analysis is useful to predict the time and duration at which water levels are above normal, such as during spring, which can be beneficial in assessing the potential hydrologic stress on vegetation and can guide the selection of appropriate mitigation plant mixes.

The installation of monitoring wells is detailed in, "Installing Monitoring Wells/Piezometers in Wetlands," WRAP Technical Note 00-02 dated July 2000. This document is available at <http://www.wes.army.mil/el/wrap/pdf/tnwrap00-2.pdf>.

Planned Vegetation

When planning for vegetation, the stated goals and objectives should drive the decision-making process. At a minimum, the New York District requires applicants to include the following items in their planting plan:

- *Native plant species composition.* In addition to the use of native hydrophytes, all mitigation plans shall specify intended species composition. This enables a quantifiable measure to track success. Quality and availability of planting materials may be limited and should, therefore, be factored into the construction and monitoring phases;
- *Source of native plant species, stock type, and plant age or size.* Plants salvaged from the impact site may be the best source of native plant species and should generally be given first consideration over nursery stock. Natural seed banks are another on-site source of propagules, which should be considered in the mitigation plan. Furthermore, beware of and account for nearby sources of invasive species. Invasive species tend to outcompete their non-invasive counterparts and can lead to costly setbacks if not detected early. The type of plant material or stock type (e.g., bare root, container, or seed) shall be specified in the mitigation plan and carefully considered. In addition, plant size/age should also be considered in terms of what will provide the best results for a given set of goals and objectives. Due to a greater amount of stored carbohydrates, trees with relatively larger diameter-at-breast-height (dbh) measurements have a greater relative survivability than smaller diameter stock. Ultimately, emphasis should be placed on the stated goals and objectives of the project and the most successful way to attain them. If an applicant intends to purchase plant material from a nursery or similar supplier, the mitigation plan should include the contact information for the nursery and the geographic source of the plant material if different from the nursery. Nurseries may have limited quality and availability of plant material that may limit site design. It is also important to consider the source location of plant material because locally derived plants are more likely to have evolved attributes that confer greater resilience to local conditions: A factor which can lead to greater success;
- *Plant zonation/location map.* All mitigation plans involving restoration, enhancement, or establishment must include a scale drawing, to include plan view and cross-sectional views. In addition to proposed grading, these maps must indicate the precise location of all plantings and descriptive information such as the name and number of species proposed;
- *Plant spatial structure.* All mitigation plans must state the quantities and densities of all plant species proposed, the percent cover intended for each species, and the intended stratification all proposed vegetation layers. Planting densities will vary depending on the system being proposed, the specific species involved, their location in the landscape, plant size, and planting technique, all of which vary too widely to be included in this guidance document. A reference system is useful in this regard. In some forested systems, tree and shrub density can reach 600 stems/shrubs per acre, but generally should not be less than 400 stems/shrubs per acre. Where uniform coverage is anticipated, herbaceous stock should be proposed in densities not greater than the equivalent of 3 feet on center for species which spread with underground stems; 2 feet for species which form clumps;

- *Use of Mulch.* Mulching is not always necessary. As with planting densities, too many variables exist to recommend specific criteria. Nevertheless, the use of mulch should be considered when the objective is to control erosion, to prevent soil compaction, to control moisture loss and weedy plant growth, to moderate soil temperatures, to enrich the soil, or any combination of these. We advise the applicant to consult their the Natural Resources Conservation Service (NRCS) or their respective county's Soil and Water Conservation District (SWCD) for more specific information on the proper use of mulch in a mitigation project;
- *Plan appropriately of wildlife.* Habitat function is an important consideration for many mitigation projects. Therefore, planting plans should be designed appropriately in order to provide for the habitat needs of the wildlife species the mitigation project is meant to address. Applicants are encouraged to seek specific guidance from their local NRCS office, the United States Fish and Wildlife Service (USFWS), or their respective county's (SWCD);
- *Control for herbivory in advance.* As with other forms of disturbance, herbivory can jeopardize the success of a mitigation project. Therefore, it is prudent to anticipate all threats to the project from herbivores. It is recommended that fencing be erected to exclude herbivores, wherever this technique will be effective. The use of protective "tubes" to control herbivory of woody species is also recommended where necessary;
- *Other abiotic factors of concern.* Pay particular attention to appropriate planting elevation, depth, and seasonal timing, as these factors are often species specific. In addition, consider the amount and duration of solar radiation at the mitigation site, as well as site aspect when developing a project.

Planned Soils

Soils and substrate are critical components of wetland ecosystems. They form the structure in which the wetland is formed and serve as a biological interface to support macro- and microinvertebrates and microbial populations, to act as a medium for plant growth, and to facilitate water quality improvements.

Substrate materials for constructed wetlands should provide a good rooting medium for mechanical support and anchoring of emergent and aquatic species. Substrate materials should also be capable of supplying nutrients to aid in establishment of target plant species and should contain enough organic matter to sustain microbial populations.

Substrate design should include evaluations of naturally occurring wetland systems in similar settings. Mimicry of a natural wetland system is desirable. The reference wetland should be located as close as possible to the anticipated construction or restoration site and should be accessible for data collection and evaluation. Soil parameters such as texture, permeability, bulk density, percent organic matter content, pH, cation exchange capacity, salinity (concentration of soluble salts expressed in units of electrical conductivity) and nutrient content may be evaluated. Rooting depths of dominant plant species should also be noted; these are helpful in planning substrate depths for the proposed wetlands construction site. In addition to the tests noted above, standard agronomic soil tests for agricultural crops and/or erosion control practices also can be completed. Potential substrate materials should also be subjected to the same suite of soil tests for comparison with the substrate in the reference wetland.

Use of hydric soils salvaged from the wetland area to be replaced is encouraged if invasive plant species seed banks are not present.

Planned Habitat Features

Planned habitat features should be incorporated into the mitigation plan to encourage use by fish and wildlife. Examples of features to be considered include but are not limited to micro-topography, rock mounds, nesting platforms, nest boxes, snags, diverse/dense plantings, berry producing shrubs, structure, etc.

Vegetated Buffers

In most cases, a protected (preserved) buffer will be required, and should be proposed as part of the mitigation plan. Most beneficial are buffers that exist around existing aquatic resources and established, restored, and enhanced mitigation site(s), including stream mitigation as this is of benefit on a local and watershed scale. The extent of the buffer should depend upon the landscape position of the site(s) and current and potential surrounding land uses. Generally, the minimum of a one hundred foot buffer surrounding mitigation sites may be adequate, however, the stated goals and objectives will determine the width of the buffer.

Coarse (large) Woody Debris

Coarse woody debris includes such materials as logs, stumps, smaller branches, and snags and, depending on your goals and objectives, should be incorporated into the wetland mitigation design. As much as possible, these materials should be in various stages of decomposition and salvaged from natural areas cleared for the other elements of the project.

G. STREAM MITIGATION

Regulatory Guidance Letter No. 02-02 states that stream functions lost due to unavoidable stream impacts must be mitigated. Compensatory mitigation for impacts to streams should primarily include enhancement of degraded stream channels. Stream mitigation designs should provide appropriate replacement of the stream reach's anticipated lost aquatic functions. Objectives that should be considered when choosing a stream mitigation site and design should include: the restoration of lotic aquatic habitat, the improvement of water quality functions, and the use of natural channel design and bioengineering techniques and principles.

Refer to the following documents for further stream enhancement guidance: "Stream Corridor Restoration: Principles, Processes, and Practices," revised August 2001, USDA-Natural Resources Conservation Service; and "Stream Management-Concepts and Methods in Stream Protection and Restoration," Fischenich, J.C. and Allen, H. June 1999, U.S. Army Corps of Engineers, Water Operations and Technical Support Program.

Site Selection

Stream mitigation should generally be performed on a stream system with the same habitat as the impacted stream. Mitigation should be accomplished within a stream reach of similar size and location within the watershed, within the same sub basin (11-digit Hydrologic Unit Code, HUC), and as close to the impacted site as possible. Stream mitigation should be performed on streams with the ability to be enhanced to include similar habitat components (for example: cold water streams, warm water streams). Priority should be given to mitigation sites that have the potential to improve habitat for state or Federally threatened and endangered (T&E) species.

Baseline Information

Stream impacts are typically assessed during the permitting phase of project development. This guidance focuses instead on assessments and designs that should be conducted within streams that are proposed to be enhanced.

Stream quality can be determined and evaluated using any method that incorporates stream morphology, hydrology, streambank stability, and biological components. The evaluation should identify basic water quality parameters so that improvements proposed as part of the mitigation package are identified. For instance, an assessment that shows a stream having high erosion at a specific location should be expanded so that the source of the erosion can be identified. After the source is identified, the applicant can determine if the problem can be corrected as part of the mitigation package. Mitigation goals and objectives should be determined using the results of the baseline study of stream reach in question. Stream assessments should be conducted so that the particular erosion event causes are adequately understood, be it during bankfull and/or lowflow conditions.

Mitigation Plan and Design

The project plan should be designed to achieve the maximum level of improvement and should result in the enhancement of the channel to its most probable natural state. Mitigation goals should be to establish the maximum biological, chemical and physical integrity possible in the current environment. All plans should include appropriate erosion and sedimentation controls.

Many bioengineering techniques can be used to enhance a stream reach. Enhancement can include stream and streambank stabilization, the improvement of instream aquatic habitat with boulder placement etc., the revegetation of unstable buffers, the removal of fish migration impediments such as dams and failing culverts, the removal of stormwater outfalls, the improvement of stormwater water quality entering the stream, etc. Stream enhancement methods, plans, and techniques are a case-by-case determination and design decisions should be based on the functional assessment of the mitigation site.

Riparian Zones and Buffers

Buffer protection for stream mitigation is encouraged and typically required to ensure the protection of the enhanced stream segment. In most cases, a deed-protected or otherwise protected buffer on each side of the stream will be required at stream mitigation sites. Wider buffers provide increased benefits to adjacent waters and their protection is encouraged.

Planting the riparian zone should be done as work proceeds or immediately upon completion of stream construction activities. Stream buffers should be planted with native vegetation that represents both woody and herbaceous species. Species selection should be based on a survey of the vegetation from a less degraded section of the stream being enhanced. Live staking, with such species as willow or dogwood, or the application of other bioengineering methods is recommended to provide bank stability and shade soon after project completion. Herbaceous vegetation should be established through plantings or by seeding with a native riparian seed mix. A project site re-vegetation plan for all disturbed activities is required as part of the mitigation proposal.

H. SITE PROTECTION AND FINANCIAL ASSURANCE

The Corps requires in-perpetuity protection for most compensatory mitigation sites. Because the States, and not the Federal government, establish real estate laws, the Corps relies on State conservation laws in approving legal instruments for the permanent protection of mitigation sites. We generally recognize three forms of protection: (1) title transfer or sale (for a restricted purpose) to a public body (i.e., municipality) or state-approved not-for-profit conservation organization, (2) a conservation easement held by a public body or state-approved not-for-profit conservation organization, but owned by the applicant, their respective successors, assigns, lessees, or other occupiers and users, and (3) a deed restriction placed on the mitigation site(s). Due to differing degrees of legal protection we prefer outright transfers and conservation easements to deed restrictions.

Early planning to permanently protect the mitigation site(s) is paramount because of the need to solicit potential grantees and secure an agreement, which includes negotiating the terms of the easement and establishing management fees associated with in-perpetuity protection. An important consideration for both public bodies and not-for-profit conservation organizations is how much to charge the grantor of an easement for the future management of the mitigation site(s) in-perpetuity. We encourage all parties to utilize tools such as the Property Analysis Record (PAR) developed by the Center for Natural Lands Management (CNLM). The CNLM can be contacted at the following website: <http://www.cnlm.org/>. In an effort to remove many of the above obstacles, we have been working more closely with municipalities and conservation organizations to achieve interest-based consensus on this subject.

Applicants proposing to simply deed restrict the mitigation sites, rather than the more preferred methods mentioned above, must first document all efforts made to secure a grantee for either title transfer or sale, or a conservation easement. This documentation must include all contacts made in this regard as well as their stated reasons for rejecting the proposal. All

applications with a mitigation requirement must include this documentation with their mitigation proposal, which must clearly state the proposed means of protection. In all cases, the legal instrument of protection shall be recorded with the appropriate state or county office.

In certain cases, we may require applicants to post a bond or other means of financial assurance for construction and monitoring of the wetland mitigation site(s). Additional financial resources may likely be necessary to defray reasonably foreseeable, future costs associated with in-perpetuity protection, as discussed above. If required, financial assurances must be arranged by an approved firm licensed to provide such services in the state where the mitigation project is located. At a minimum, the amount of the financial assurance must be sufficient enough to cover the cost of: (1) hiring an independent contractor to construct the mitigation project (construction assurance); and (2) to hire an independent contractor to conduct maintenance and monitoring during the monitoring phase (maintenance assurance). Portions of these financial assurances will be released once the Corps determines that the applicant has complied with the terms of each phase (i.e., construction phase and monitoring phase) set forth in the permit.

I. MONITORING PLAN AND REPORT

Monitoring is required to determine whether or not the established performance standards are being met at the mitigation site. Monitoring plans need to incorporate quantitative measures to properly evaluate performance standard achievement.

Monitoring Report Elements

- A restatement of the goals, objectives and performance standards for the compensation site plan.
- Identification of any structural failures or external disturbances on the site.
- A description of management activities and corrective actions implemented during the past year.
- A summary of and full presentation of the data collected during the past year.
- A site map showing the locations of data collection, including the location of monitoring wells and gauges.
- An assessment of the presence and level of occurrence of invasive species.
- A vegetative cover map (actual, not proposed) of the mitigation site.
- Photographs showing all representative areas of the mitigation site.
- Surface and groundwater elevations, as required by permit conditions.
- An assessment of the degree to which performance standards are being met.
- Proposed corrective actions to attain performance standards.
- A narrative summary of the results and conclusions of the monitoring.

Compensatory mitigation plans will identify the party(ies) responsible for accomplishing, maintaining, and monitoring the mitigation. Districts will require monitoring plans with a reporting frequency sufficient for an inspector to determine compliance with performance standards and to

identify remedial action. Monitoring will be required for an adequate period, normally 5 to 10 years, to ensure the project meets performance standards. Corps permits will require permanent compensatory mitigation unless otherwise noted in the special conditions of the permit.

As-Built Plans

As-built plans are to be submitted in accordance with permit conditions and should be incorporated in the first monitoring report. Plans should include:

- Identify site, designer, and sponsor.
- Identify the construction contractor.
- Dates of construction (including completion date).
- Describe any changes to the original plan.
- Describe problems encountered during construction and what was done to correct the problem.
- List any follow-up corrective actions needed, provide a schedule, and list who is responsible.
- Provide the as-built plans and cross-sections.

J. MAINTENANCE AND ADAPTIVE MANAGEMENT PLAN

Adaptive management is a technique that involves incorporating new information into all stages of a mitigation project for the purpose of adjusting to changing field conditions. Adaptive management is used to keep the project developing toward the achievement of the stated mitigation goals and objectives. To this end, we recommend that mitigation projects be actively “managed” by a competent specialist or site manager.

The adaptive management plan should include the identification and solutions to potential challenges (on-site and off-site adverse influences) that pose a risk to the project’s success including, but not limited to, flooding, drought, invasive species, site degradation, structural failure, and excessive sediment and wrack deposition.

Early monitoring should be conducted as part of adaptive management. Develop a thorough monitoring plan as part of an adaptive management program that provides early indication of potential problems and direction for correction actions.

Maintenance activities including inspections for plant replacement, weeding, fertilization, erosion control, herbivore protection, trash and wrack removal, and/or any other such activities should be part of the adaptive management plan.

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U.S. Environmental Protection Agency

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1-800-832-7828

National Marine Fisheries Service

212 Rogers Avenue
Milford, CT 06460-6499
(203) 882-6504

74 Magruder Road
Highlands, NJ 07732
(732) 872-3023

Natural Resources Conservation Service

http://offices.usda.gov/scripts/ndCGI.exe/oip_public/USA_map

New York State Department of Environmental Conservation

<http://www.dec.state.ny.us/website/about/abtrull3.html>

New Jersey Department of Environmental Protection

Land Use Regulation Program
P.O. Box 439
Trenton, New Jersey 08625-0439
(609) 292-1235

Attachment 2

NEW YORK DISTRICT U.S. ARMY CORPS OF ENGINEERS COMPENSATORY MITIGATION PLAN CHECKLIST

Applicant: _____
Agent: _____
Project Name: _____
Site Address: _____
Town/County/State: _____
Application Number: _____

NOTE: All information included in this checklist is provided as guidance for use during the preparation of mitigation plans. This guidance has been prepared to incorporate as many aspects of a mitigation plan as possible. The level of information required for each mitigation area is project specific, as are the scale and type of mitigation. This document is intended to provide guidance and may not require the use of all information included herein. Where applicable, information should be provided to the extent possible. It is recommended that you consult with the U.S. Army Corps of Engineers New York District prior to finalizing mitigation plans. See the attached guidance document for additional information and more detail on information provided in this checklist.

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- H. Site Protection and Financial Assurances**
- I. Monitoring Plan and Report**
- J. Maintenance and Adaptive Management Plan**

A. Mitigation Justification:

1. Demonstrate that impacts are avoided and minimized to maximum extent practicable (404 (b)(1) guidelines met).
2. Discuss mitigation sequencing

B. Mitigation Goals and Objectives

1. Impact Site
 - a. ☐ Describe and quantify the aquatic resource size, type, functions and values that will be impacted at the proposed impact site.

Attachment 2

- b. ☐ Describe aquatic resource concerns in the watershed (e.g. flooding, water quality, habitat) and how the impact site contributes to overall watershed/regional functions.
 - c. ☐ Identify watershed or other regional plans that describe aquatic resource objectives.
2. Mitigation Site
- a. ☐ Describe and quantify the aquatic resource size, type, functions and values for which the mitigation project is intended to provide.
 - b. ☐ Describe the contribution to overall watershed/regional functions that the mitigation site(s) is intended to provide.
 - c. ☐ Description of mitigation type(s) and explain why type(s) selected is the environmentally preferred alternative.
 - d. ☐ Broad statement of what is intended to be accomplished through the mitigation project.

C. Performance Standards

- 1. ☐ Identify clear, precise, quantifiable parameters that can be used to evaluate the status of desired functions.
- 2. ☐ Describe how performance standards will be used to verify that objectives identified in the Mitigation Goals and Objectives Section will be attained.

D. Mitigation Site Selection

- 1. ☐ Description of site selection practicability in terms of cost, existing technology, and logistics.
- 2. ☐ Existing mitigation site deed restrictions, easements and rights-of-way and a description of how the existence of any such restriction will be addressed, particularly in the context of incompatible uses.
- 3. ☐ Explanation of how the design is sustainable and self-maintaining.
- 4. ☐ Design constraints.
- 5. ☐ USFWS and/or NOAA Fisheries listed species clearance letter or Biological Opinion (if there is a concern about federally listed endangered species).
- 6. ☐ SHPO cultural resource clearance letter (if there are known historic or cultural resources in the area).

E. Baseline Information (required for both the impact site and mitigation site(s))

- 1. Location, Maps, Photos
 - a. ☐ Coordinates (latitude and longitude or UTM)
 - b. ☐ Written location description (physical site address, property location)
 - c. ☐ Section, block, lot, township/city/village, county
 - d. ☐ Hydrologic Unit Code (11 digit HUC)
 - e. ☐ Detailed vicinity map
 - f. ☐ Map identifying project location and resources within the watershed

Attachment 2

- g. ☐ Other maps including National Wetlands Inventory map (NWI), Natural Resources Conservation Service soils map (NRCS), New York City Department of Environmental Protection watershed, Adirondack Park Agency, etc
- h. ☐ Aerial/Satellite photos
- i. ☐ Site photos and photo location map
- 2. Site Information:
 - a. ☐ Describe type and purpose of work at each impact site
 - b. ☐ Describe and quantify the aquatic resource size, type, functions and values that will be impacted at the proposed impact site.
 - c. ☐ Describe the proposed temporary and permanent impacts to the aquatic environment
 - d. ☐ Surrounding land use
 - e. ☐ Impairment status and impairment type of aquatic resources
 - f. ☐ Percent agriculture, forested, wetland, developed, etc.
 - g. ☐ Size/Width of natural buffers (describe, show on map)
 - h. ☐ Current owner(s)
 - i. ☐ Adjacent property owners
 - j. ☐ Existing wildlife usage (including but not limited to State and Federally listed species)
 - k. ☐ Known or potential cultural resources
 - l. ☐ Historic and current land use
 - m. ☐ Known listed hazardous materials sites
 - n. ☐ Contaminants in water and sediments (e.g. heavy metals, PCB's)
- 3. Watershed:
 - a. ☐ Description of landscape connectivity
 - b. ☐ Describe aquatic resource concerns in the watershed
 - c. ☐ Proximity and connectivity of existing aquatic resources and natural upland areas (show on map)
 - d. ☐ Amount of aquatic resource area that the impact site represents for the watershed and/or region (i.e., by individual type and overall resources)
 - e. ☐ Documentation of local coordination
- 4. Wetland Classification and Functional Assessment
 - a. ☐ Classification of the wetland
 - b. ☐ Assessment of the functions and values of the wetland
- 5. Existing Hydrology
 - a. ☐ Delineation of all waters on site, with contours
 - b. ☐ Water budget and hydroperiod
 - c. ☐ In tidal waters, spring high tide, mean high water, and mean low water elevations
 - d. ☐ Watershed area
 - e. ☐ Plan showing monitoring wells or other gauges used to determine the water level fluctuation of the wetland for and extended length of time
 - f. ☐ Monitoring well or gauge data
 - g. ☐ Cross-section of existing seasonal water levels
 - h. ☐ Results of models used
 - i. ☐ Nutrient inputs and outputs, including N, P, pH, TSS, DO, etc.

Attachment 2

6. Existing Dominant Vegetation
 - a. ☐ Map showing size and location of different plant communities
 - b. ☐ Community structure (e.g. vegetative layers, canopy stratification)
 - c. ☐ Wetland indicator status (National List of Plant Species That Occur in Wetlands: Northeast (Region 1), published by the U.S. Fish and Wildlife Service. USFWS Biological Report 88(26.1) May 1988.
 - d. ☐ General age and health
 - e. ☐ Native/non-native/invasive status
7. Existing Soils
 - a. ☐ Soil profile and survey classification and description, including all series onsite
 - b. ☐ Identification of any contaminants

F. Mitigation Work Plan

1. Construction
 - a. ☐ Maps marking boundaries of proposed mitigation types; include DGPS coordinates.
 - b. ☐ Timing of mitigation: before, concurrent or after authorized impacts; if mitigation is not in advance or concurrent with impacts, explain why it is not practicable and describe other measures to compensate for the consequences of temporal losses.
 - c. ☐ Indicate existing and proposed elevations and slopes.
 - d. ☐ Describe plans for establishing appropriate micro-topography
 - e. ☐ Plan showing proposed contours at 1 foot intervals in wetlands, scale between 1" = 20' to 1" = 50', 8 1/2 by 11 sheets with overview plan and match lines, and 1 Set of full size plans
 - f. ☐ Representative cross section(s)
 - g. ☐ Description of construction methods (e.g., equipment to be used)
 - h. ☐ Construction schedule
 - I. ☐ Expected start and end dates of each construction phase
 - II. ☐ Expected date for as-built plan
 - i. ☐ Water handling plan
 - j. ☐ Erosion and sedimentation plan
 - k. ☐ Planting/seeding schedule
 - l. ☐ Environmental monitor/manager
2. Planned Hydrology
 - a. ☐ Proposed water budget and hydroperiod
 - b. ☐ Any changes to watershed area
 - c. ☐ Plan showing locations of monitoring wells or other gauges that will be used to determine the water level fluctuation during the monitoring period
 - d. ☐ Cross-section of predicted seasonal water levels
 - e. ☐ Changes proposed that will affect model results
 - f. ☐ Proposed changes to existing nutrient inputs and outputs, including N, P, pH, TSS, DO, etc.
 - g. ☐ Explanation of factors and decisions determining proposed mitigation site grading and planting plan

Attachment 2

- h. ☐ Explanation of likelihood of mitigation success, based on proposed hydrology
- 3. Planned Vegetation
 - a. ☐ List of native hydrophytes (i.e., wetland plants) using scientific names and regional indicator status (include seed mix composition)
 - b. ☐ Source of native plant species, stock type, plant age(s)/size(s).
 - c. ☐ Plant zonation/location map
 - d. ☐ Plant spatial structure, e.g., quantities, densities
 - e. ☐ Community structure (e.g., vegetative layers, canopy stratification)
 - f. ☐ Expected natural regeneration from existing seed bank, plantings, and natural recruitment.
 - g. ☐ Use of mulch (not always necessary).
 - h. ☐ Wildlife plan.
 - i. ☐ Herbivory control plan.
 - j. ☐ Consideration of other abiotic factors.
- 6. Planned soils
 - a. ☐ Source of the soils
 - b. ☐ Percent organic content
 - c. ☐ Include a soil specification
 - d. ☐ Erosion and soil compaction control measures
- 7. Planned habitat features - include a description of planned coarse woody debris, rock mounds, microtopography, wildlife/fisheries structures, etc.
- 8. Planned buffer (identify on map).
 - a. ☐ Evaluation of the buffer's expected contribution to aquatic resource functions
 - b. ☐ Location, dimensions
 - c. ☐ Native plant composition, spatial and vertical structure
- 9. Other planned features- interpretive signs, trails, fence(s), etc.

G. Stream Mitigation Checklist

- 1. Site Selection- explanation of the site selection criteria
- 2. Baseline Information:
 - a. ☐ Coordinates (latitude/longitude)
 - b. ☐ Written description (physical site address, property location)
 - c. ☐ Section, block, lot, township, city, village, county
 - d. ☐ Hydrologic Unit Code (11 digit HUC)
 - e. ☐ Surrounding land use (% agriculture, forest, development, etc.)
 - f. ☐ Detailed site map, with contours and watercourse/wetland delineation
 - g. ☐ Area of proposed impacts, indicated on the site plan
 - h. ☐ Delineation and size of the watershed including sub-catchments
 - i. ☐ NWI, NRCS maps, state wetland maps, aerial and satellite photos
 - j. ☐ Site photos
- 3. Functional Assessment
 - a. ☐ Watercourse functional, ecological, hydrologic, and hydraulic assessments completed (assessments should be comprehensive and should be used to reach the mitigation goals and specific restoration/enhancement aspects)

Attachment 2

- b. ☐ Type of assessment methods
- c. ☐ Physical description of the mitigation site: Size, length, etc.
- 4. Existing Hydrology
 - a. ☐ Water budget- inflow, outflow, water sources, hydroperiod
 - b. ☐ Bankfull elevation and flow rate
 - c. ☐ Nutrient loads (TSS, DO, pH, etc)
- 5. Mitigation Plan and Design
 - a. ☐ Identification of mitigation goals including, but not limited to: stream and streambank stabilization, the improvement of instream aquatic habitat with boulder placement etc., the restoration and revegetation of unstable buffers, the removal of fish migration impediments such as dams and failing culverts, the removal of stormwater outfalls, the improvement of stormwater water quality entering the watercourse
 - b. ☐ Description of proposed methods to be employed to meet above identified mitigation goals, utilizing bioengineering construction techniques
 - c. ☐ Description of erosion and sedimentation control during construction
 - d. ☐ Description of site restoration after construction completion
- 6. Riparian Zones and Buffers
 - a. ☐ Size, width, and ecological description of buffer
 - b. ☐ Restoration and protection measures to be employed including native plantings and deed restrictions

H. Site Protection and Financial Assurances

- 1. Instrument of legal protection
 - a. ☐ Conservation easement
 - b. ☐ Deed restriction
 - c. ☐ Transfer of title
- 2. Responsible parties and their role
 - a. ☐ Site owner (Grantor)
 - b. ☐ Easement owner (Holder/Grantee)
 - c. ☐ Maintenance implementation
- 3. Financial Assurances (if applicable)

For each of the following, identify party(ies) responsible to establish and manage the financial assurance, the specific type of financial instrument, the method used to estimate assurance amount, the date of establishment, and the release and forfeiture conditions:

 - a. ☐ Construction phase
 - b. ☐ Maintenance
 - c. ☐ Monitoring
 - d. ☐ Remedial measures
 - e. ☐ Project success
- 4. Types and schedules of financial assurances (if applicable)
 - a. ☐ Performance bonds
 - b. ☐ Irrevocable trusts
 - c. ☐ Escrow accounts

Attachment 2

- d. ☐ Casualty insurance
- e. ☐ Letters of credit

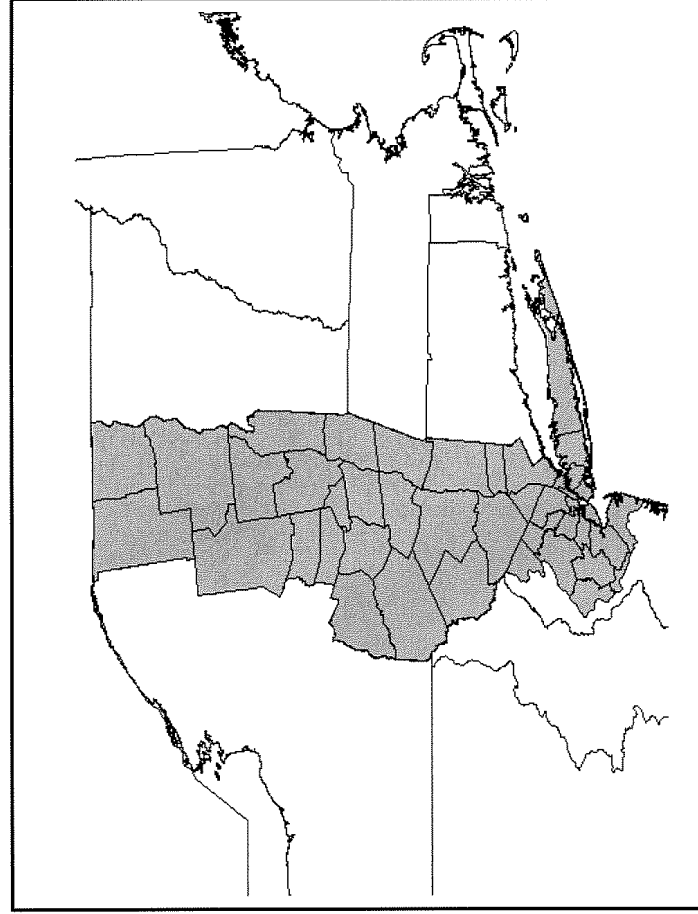
I. Monitoring Plan

1. Responsible parties and their role
 - a. ☐ Site owner
 - b. ☐ Easement owner
 - c. ☐ Monitor
2. Monitoring plan info
 - a. ☐ Identification of monitoring measures that will ensure the achievement of the performance standards
 - a. ☐ Quantitative data to be collected and reported (i.e. as built drawings)
 - b. ☐ Monitoring schedule, frequency, duration, monitoring stations (including transect locations on map)
3. Functional assessment
4. Monitoring report submission plans (dates, etc)

J. Maintenance and Adaptive Management Plan

1. Maintenance Plan and Schedule
 - a. ☐ Environmental monitor/manager
 - b. ☐ Invasive species control plan (plant and animal)
 - c. ☐ Measures to control predation/grazing of mitigation plantings
 - d. ☐ Replacement planting plan
 - e. ☐ Structure maintenance/repair
 - f. ☐ Chemical controls or amendments
2. Adaptive Management Plan
 - a. ☐ Identification/solutions to potential challenges that pose a risk to project success
 - b. ☐ Discussion of potential remedial measures in the event mitigation does not meet performance standards in specified time frame.

Attachment 3. The New York District's Regulatory Boundary



- State Line
- Baltimore District
- Buffalo District
- New England District
- Philadelphia District
- County Line
- NY District's Regulatory Boundary



Attachment 4

RESPONSE TO PUBLIC NOTICE COMMENTS:

Background

On December 18, 2003 the U.S. Army Corps of Engineers, New York District (NYD) published a Special Public Notice requesting public comment on the "Draft Compensatory Mitigation Guidelines" and "Draft Mitigation Checklist". These documents were developed pursuant to the Regulatory Guidance Letter No. 02-2 (December 2002), the National Wetlands Mitigation Action Plan (December 2002), and the "Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act (CWA) Section 404(b)(1) Guidelines" (May 1990). It is intended that the Compensatory Mitigation Guidelines and Mitigation Checklist assist the regulated public in the preparation of compensatory mitigation and monitoring plans and provide information to ensure compensatory mitigation sites successfully replace aquatic resource functions unavoidable lost or adversely affected by authorized activities, as well as improve the success of compensatory mitigation overall with emphasis on a regional watershed approach.

Discussion of Public Comments

In response to the December 18, 2003 Public Notice, we received more than 300 comments. We reviewed and fully considered all comments received in response to the Public Notice. The significant issues raised during the public notice comment period and the changes that have been made from the original proposal are discussed below. Several comments received expressed recommendations regarding the information contained in Regulatory Guidance Letter No. 02-2 (December 2002), and the National Wetlands Mitigation Action Plan (December 2002). It should be noted that the concepts and action items identified in these existing guidance documents were developed through a multi-agency review and support the national policy of "no overall net loss" of wetlands and other waters of the United States, consistent with Section 404(b)(1) Guidelines. In addition, these documents were used in the development of the Compensatory Mitigation Guidelines and Mitigation Checklist. Therefore, the comments expressed regarding these existing multi-agency guidance documents were not addressed within the context of this document. It should be noted however, that those comments expressed regarding the National Wetlands Mitigation Action Plan (December 2002), will likely be addressed during the development of the action items identified in that document.

After considering the comments received in response to the December 18, 2003 Public Notice, several changes were incorporated into the Compensatory Mitigation Guidelines and Mitigation Checklist documents. Finally, many commenters recommended that a variety of mitigation policies, concepts, technical guides, and specific examples be included in the Compensatory Mitigation Guidelines and Mitigation Checklist. However, to avoid a lengthy and cumbersome document, and ensure the development of a document that will provide the required technical guidance to prepare and submit mitigation plans, web addresses have been included where appropriate to allow applicants to review the referenced policies, concepts, and other various documents, in full, and in their intended context.

General Introduction Comments

Several commenters expressed recommendations regarding the introduction of the Mitigation Guidelines. Many of these comments referred to the above referenced documents that were used in the development of the Compensatory Mitigation Guidelines and Mitigation Checklist. As indicated above, these comments will not be addressed in this document. One commenter recommended that sufficient provisions be included in the guidance regarding enforcement. The Corps agrees that enforcement provisions are important to ensure that impacts to regulated aquatic resources have been properly compensated for, and guidance has been included in the Mitigation Guidelines to ensure this. A few commenters requested that specific examples of conservation easements and covenants be incorporated into the document. Although the Corps acknowledges this recommendation, each conservation easement document is site specific in regards to the goals, objectives and responsibilities established for maintaining the conservation project. In instances where a Conservation Easement may be required, the Corps recommends that applicants discuss this issue early on in the application process. One commenter recommended that an explanation of state programs be integrated into the document. The Corps acknowledges this recommendation, however, this document was developed to provide technical guidance to applicants in the preparation of compensatory mitigation plans for the Corps review. In those instances that will require review at both a state and federal level, the review process will remain as it has in the past, which includes Corps interagency consultation prior to the approval of the plan.

Basic Requirements for Success

The ten basic requirements for success was taken from Operational Guidelines for Creation or Restoring Self-Sustaining Wetlands, National Research Council "Compensating for Wetlands Losses Under the Clean Water Act," June 2001 (Chapter 7, pp. 123-128) and was used in the development of the Mitigation Guidelines.

In response to several commenters that requested clarification to the placement of a mitigation site adjacent to an existing wetland or greenspace, the preference of restoration and enhancement over establishment (creation), the use of water control structures, and hydrogeomorphic and ecological landscape, it should be noted that these issues are discussed in detail in the ten Basic Requirements for Success and can be reviewed in full at: <http://www.epa.gov/owow/wetlands/guidance>

A commenter requested that a list of acceptable genotypes be added to the document. Although this is an important factor and may be site specific, project details such as this can be discussed during the preliminary review of the mitigation plan. A commenter suggested that irrigation as the sole source of water not be allowed. The Mitigation Guidelines document has been changed to reflect this suggestion under the "Planned Hydrology" section of "Baseline Information". One commenter suggested that payment of money be allowed as a mitigation possibility. Applicants proposing this type of compensatory mitigation should review the In-Lieu-Fee guidance as referenced in the Mitigation Guidelines. A comment stated that the early discussion of 'coarse (large) woody debris' should reference the discussion of the term, which appears later in the document. This wording has been added to the document. One comment stated that establishment (creation) and restoration sites of disturbed or degraded sites should be reviewed by the U.S. Fish and Wildlife Service to ensure they area would not become an

'attractive nuisance'. There are existing Federal Regulations that require the Corps to consult with the appropriate federal and state resource agencies when reviewing permit applications.

Definitions

Invasive Species: Three commenters stated that the definition of "*Invasive Species*" should be revised in that some native species could also be considered invasive. While it is true that the majority of plants in New York that would be characterized as invasive are non-native, there are also some native species that would also be considered to be invasive (*e.g.*, black locust). We have therefore re-worded the definition and included links to information on regional invasive plant information.

Enhancement and Restoration: One commenter stated that the Corps should further define and differentiate between the terms "*enhancement*" and "*restoration*". One commenter stated that the term restoration should state "*Return of a wetland or former wetland...*" Two commenters stated that return of an upland area to a previous wetland status should be included in the definition of restoration.

It is important that the understanding of these two terms in relation to the Corps' regulatory program is made clear and we have therefore revised the definitions. Our intention is that an area to be ***restored*** would *not* be an existing wetland (*i.e.*, meeting the current criteria of the 1987 Manual) at the time of the proposed restoration project, but that historically was a wetland. The term ***enhancement*** is used when there are existing wetland functions being performed, but the goal is to either add to or improve on one or more existing functions. Wetland ***restoration*** does result in a gain in wetland acreage, whereas wetland ***enhancement*** does not. The definitions of these two terms have been revised.

Wetlands Establishment: One commenter questioned filling in an open water area as an appropriate mitigation measure. While we agree that in most cases this would not be considered an appropriate mitigation measure, it would still meet the definition of "*establishment*."

Native Species: A number of commenters stated that the definition of the term "*Native Species*" is incomplete. This was due to a typographical error, which has been fixed. One commenter suggested the use of the word "*indigenous*" in with the definition of Native Species. Since the term "*indigenous*" is used synonymously and interchangeably with "*native*", it has been added.

Non-Native Species: One commenter suggested using the following "... *that is not native to that regional ecosystem*" for the phrase "*Non-native*". We have determined that the definition for Non-Native Species was not necessary in that the term Native Species was clarified.

Protection/Maintenance (Preservation): One commenter stated that the definition of Protection/Maintenance should read that preservation results in a loss of wetlands. While we agree that preservation alone as mitigation for a project can result in a loss of wetland acreage, we felt that it was not necessary to state this in the definition. Another commenter stated that this definition should not include structural protection or repair, in that these should not be a form of mitigation – noting especially that repairs to barrier islands are most often to serve human infrastructure and not beach dependent flora or fauna. While we do recognize that structural protection and/or repair could be a form of mitigation, we generally agree with the

commenter that this category of activities should not be included in the more central mitigation effort of preservation. Therefore, the definition has been rewritten to define just the term preservation.

Watershed Approach: One commenter stated that the phrase “*entire systems and their constituent parts*” and especially the word *system* should be clarified and examples provided. This commenter also provided a valuable discussion of a number of considerations with regard to the complexities and ideals for wetland mitigation projects in a watershed. While we are only attempting here to provide a relatively simple understanding of approaching mitigation project design on a watershed approach, the definition has been re-worded, with the inclusion of links to informative sites for watershed-based planning.

Finally, one commenter stated that the phrase “Wetland Replication Areas” should be defined in this section. In that this phrase was used synonymously in the document with “Wetland Mitigation Areas”, the phrase within the document has been changed to the latter.

Mitigation Justification

A few commenters expressed some recommendations regarding the section of Mitigation Justification of the Guidelines. The comments stated the following concerns: more emphasis of the Section 404 (b) (1) sequencing, impact avoidance, the practicability of in-site or in-kind replacement, and avoidance and minimization costs. The purpose of this section is to briefly explain the importance of sequencing in accordance with the Section 404 (b) (1) Guidelines and the Mitigation MOA, to the general public without providing the entire technical text of the Guidelines and MOA. References for mitigation were specified in the introductory text of the proposed mitigation guidelines, which would further assist applicants in the preparation and development of an effective mitigation plan. The other issues that were raised by the commenters were adequately addressed in the sections regarding Mitigation Goals and Objectives, and Mitigation Banking.

Mitigation Banking

Several commenters requested guidance on issues such as when the use of a bank is appropriate, service area and long-term management of bank sites. These are issues addressed in the "Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (Final Rule)", dated November 28, 1995, and are not intended to be further clarified in this document. Commenters also requested additional clarification on issues such as use of off-site mitigation, out-of-kind mitigation, mitigation in other watersheds, mitigation on contaminated sites and the replacement of larger wetlands with smaller ones. We believe these issues have been adequately addressed in the document; we want to retain some flexibility in addressing some of the specific details on these issues on a project-specific basis, therefore further guidance on these issues is not necessary.

In-Lieu Fee

Several commenters requested the need for additional guidance to determine when in-lieu fee arrangements are appropriate, and their use in cases where a traditional mitigation approach such as restoring or establishing a mitigation area may hamper ongoing maritime operations.

Information regarding the appropriate use of in-lieu fee arrangements is prescribed in the Federal Guidance on the Use of In-Lieu Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, Federal Register dated November 7, 2000 (65 FR 66914), and our Compensatory Mitigation Guidance references this document. Although applicants may propose the use of in-lieu fee arrangements, these proposals will be reviewed on a case-by-case basis. It should additionally be noted that as indicated in the RGL No. 02-2, if mitigation banks or in-lieu fee arrangements are used to provide the mitigation, the party(s) identified as responsible for administering those facets of the bank or the in-lieu fee arrangements become liable for implementation and performance.

Mitigation Goals and Objectives

One commenter stated that it should be made clear in the document that a minimum of 1:1 replacement will be required for each wetland function for mitigation projects. One commenter stated that the discussion of “in-kind” and “out-of-kind” mitigation was unclear. Another commenter stated that mitigation applied outside of the watershed provides no functional replacement. This section of the document was revised to include more information on the development of goals for a mitigation projects, as well as the discussions of in-kind and watershed approaches in order to address the above comments. One commenter stated that “Creating Indicators of Wetland Status (Quantity and Quality): Freshwater Wetland Mitigation in New Jersey”, Balzano et al., 2002, should be referenced in the Mitigation Goals and Objectives section of the guidelines document. It was determined that a reference to the subject paper by Balzano et al., would not be included in this section in that there undoubtedly exist other important sources of information which pertain to studies of regional wetland mitigation success efforts, and we did not want to indicate a preference or limitation to these resources.

One commenter noted that on-site mitigation rarely results in the replacement of unusual wildlife habitat. We would note that any proposal to impact “unusual” wildlife habitat, as well as any mitigation proposed to offset those impacts, would more than likely undergo a thorough inter-agency review in order to determine if the project were the least damaging environmental alternative possible. On a case-by-case basis, the preference of “on-site” versus “off-site” as the most appropriate mitigation would be determined, and habitat functions are an important aspect of this. It is our hope that this document will provide just that line of direction in the development of mitigation plans.

One commenter stated that storm water management facilities should qualify as compensatory wetland mitigation. Generally, the New York District does not allow compensatory mitigation credit for the construction of storm water management systems. In addition, this type of mitigation proposal would not support the nations policy of “no-net-loss” of wetlands. Wetlands provide multiple functions and values to varying degrees; storm water facilities, by design, are simple in conception and function. Furthermore, due to the quality of the water source, the frequent accumulation of sediments during storm events, and their likely colonization by invasive species, the ability for this type of system to compensate for most wetland impacts is limited at best. Finally, proper long-term operation of storm water management facilities requires regular maintenance in the form of mowing/removal of vegetation and the excavation of accumulated sediments; most acceptable site protection mechanisms (e.g., conservation easement) would preclude both of these activities.

Performance Standards

One commenter indicated that invasive limitations should be compatible with the surrounding wetlands, and if surrounding wetlands or an impacted wetland area contains invasive species, then a generous proportion of such invasives should be tolerable considering the site-specific characteristics. In response to this recommendation, it should be noted that invasive species issues such as this should be identified as part of the information required under “Section D, Mitigation Site Section”, of the Mitigation Guidelines. In addition, preliminary discussions with the Corps regarding this issue are recommended prior to selecting a mitigation site and preparing a mitigation plan. An additional commenter recommended that the performance standards be measurable, attainable and reasonable. The Corps agrees with this recommendation and has included these terms in its discussion of performance standards. One commenter recommended that the Corps define quasi-natural wetlands. The Corps agrees with the commenter that this term was not clearly defined. The Mitigation Guidelines document has been modified and the Corps has decided to omit this term from the revision.

Mitigation Site Selection

One commenter recommended that the mitigation guidance specify a minimum number of alternative mitigation sites to be evaluated. The Corps’ existing mitigation site review process requires applicants to demonstrate the preferred mitigation site selection. However, due to site-specific circumstances and a sites’ specific position in the landscape/watershed, the specific number of alternative potential mitigation sites may be limited. The Compensatory Mitigation Guidance however provides a list of items that should be considered when choosing a particular mitigation site, and as in the past these sites will be reviewed on a case-by-case basis.

Baseline Information for Impact and Mitigation Site(s)

Classification and Functional Assessment:

Several comments addressed the draft’s solicitation of recommended wetland functional assessment methods. The New York District is currently in the process of reviewing various documents and functional assessment methodologies in consultation with the resource agencies. Applicants will retain the ability to use professional judgment when selecting the functional assessment method germane to each specific application, however, consultation with the Corps as well as the resource agencies is recommended when choosing and performing these assessments. One commenter recommended using an assessment approach, rather than a specific method. This wording has been added to the document. One comment stated that the functional assessment should follow a watershed (i.e., landscape) approach and include watershed-level analyses as part of the pre-project site evaluation. The comment went on to say that an increase in the availability and use of a GIS should make such an analysis cost-effective. The definition of ‘watershed approach’ has been expanded to address this concern.

A comment suggested that all six Special Aquatic Sites be added to this section. The wording has been added to the document. One comment stated that subsurface conditions including soils and sediment geochemistry and physics, groundwater quantity and quality, and infaunal communities should be evaluated during a functional assessment. This language has

been added to the document. A commenter suggested that a functional assessment should be distinguished from a wetland's legal and biological classification. This has been clarified in the document.

Existing Vegetation:

A commenter suggested that a rare plant survey be submitted if records indicate a presence. This comment has been added to the document.

Existing Hydrology:

Most comments were in regard to the water budget information, specifically that the information was inadequate and that we should indicate a baseline period for the budget. The entire section was expanded to clarify what is meant by 'water budget', what time periods are important for monitoring, and the reasons why establishing a water budget are important to wetland creation.

A commenter suggested that we ensure that the quality and quantity of the proposed source is sustainable. This language was expanded upon and added to the document.

One commenter specified that the 11-digit USGS HUCs should be provided. This information is requested within the Baseline Information section, under "Location".

A commenter specified that the terms 'input' and 'output' should be used in the water budget section. This wording has been added to the document.

Existing Soils:

Most comments for this section suggested the addition of several elements to the document including information on historical disturbances, information on the detailed soil profiles from the site, and a clarification of 'soil contaminants'. All of these comments were added to the document.

A commenter recommended a policy of giving extra functionality credit for restoring a contaminated marsh to encourage developers to incur the additional costs of remediation. Applications for this type of restoration will be reviewed on a case-by-case basis. With adequate documentation and justification, the guideline and checklist documents are written to allow for flexibility.

Site Information:

One commenter requested that species use, including threatened and endangered species use and habitat value be requested as part of the site information requirements. Information regarding these topics was included under wildlife usage as part of the site information required in the checklist, and the information regarding threatened and endangered species use is required under Section D, Site Specific Selection. In addition, and as part of the Corps existing review of the impact site, the applicant will be required to provide information regarding threatened and endangered or critical habitats the use at the impact site. One commenter recommended that a

second mitigation checklist be developed for larger projects. The mitigation checklist was developed to provide a list of required information that would be needed to assess all proposed wetland mitigation plans regardless of their size. However, the Corps realizes that the level of information required for review of a proposed plan will depend upon the scale of the mitigation project.

Mitigation Work Plan

Construction:

Several commenters stated that mitigation projects should be actively “managed” by a competent “restoration” specialist or site manager. It is our opinion that such measures may reduce the monitoring period for a project, and moreover it seems to make good business sense. This section has been revised to reflect these recommendations.

Planned Vegetation:

A commenter stated that the practicability, quality and availability of plant materials offer the greatest logistic challenge to building wetlands. In our opinion all proposed mitigation plans should only propose that which is capable of being carried out successfully. The Corps has no authority over nurseries, but consumers can affect change through choice. We have revised the Mitigation Guidelines document to reflect this viewpoint.

A commenter stated that tubes should be used to control herbivory of woody species. We believe the rationale for this comment is self-evident and should be considered in all carefully devised mitigation proposals. We have revised the Mitigation Guidelines document to reflect this viewpoint.

Several commenters stated that the planting densities in the guidelines seem to be high and that the guidelines should also recommend a range of densities. An appropriate planting density depends on species, location, plant size, and planting technique, all of which vary too widely to be included in this guidance document. We have revised the Mitigation Guidelines document to reflect these viewpoints.

Several commenters stated that physical variables such the diameter of trees and insulation should be mentioned in the guidance. In our opinion physical measurements such as diameter-at-breast-height (dbh), and the amount and duration of solar energy are useful indicators for any mitigation plan. Such information allows project managers to review mitigation plans in much greater detail, a factor that may lead to higher success rates. Moreover, these data may also be helpful in gauging progress over time. Therefore, we encourage the use of key physical variables that would have the potential to increase successful mitigation projects. We have revised the Mitigation Guidelines document to reflect these viewpoints.

Several commenters stated that the use of mulch is not recommended for all wetland systems or that it may not be appropriate altogether. It was also pointed out that not all mulch is the same (e.g., organic or inorganic) and that organic mulch should be aged as opposed to fresh. It is our understanding that, as with planting densities, the particular situation dictates protocol.

The use of mulch is recommended when the objective is to control erosion, soil

compaction, moisture loss, or weedy plant growth, to maintain even temperatures, to enrich the soil, or any combination of these objectives. We recommend consulting with the Natural Resources Conservation Service (NRCS) or respective county Soil and Water Conservation District (SWCD) for more specific information on the proper use of mulch in a mitigation project. We have revised the Mitigation Guidelines document to reflect these viewpoints.

A commenter stated that in order to avoid misrepresentation of planting plans, applicants should specify the precise location of all plantings, the exact names and numbers of species proposed, as well as their proposed abundance. We generally agree with this comment. All mitigation projects should consist of a detailed drawing and description of the precise location of all plantings, the exact names and numbers of species proposed, as well as their proposed abundance and other appropriate details. We have revised the Mitigation Guidelines document to reflect this viewpoint.

A commenter stated that with regard to habitat function, applicants should consult with available plant lists that specify plants that are beneficial to targeted wildlife species. We agree, the purpose of a mitigation plan is to restore, enhance, establish, or preserve lost ecosystem functions and values. As such, mitigation plans should specify targeted wildlife species and biotic and abiotic factors associated with their specific habitat. We have revised the Mitigation Guidelines document to reflect this viewpoint.

A commenter recommended that proposed planting schemes take into account the proximity of seed sources for natural recruitment. This assessment should include an evaluation of the proximity of invasive (i.e., native and non-native) plant species as well as non-invasive, native plant species. We agree with this recommendation and see it as consistent with a watershed approach. In addition, it is widely recognized that local seed sources are valued assets to any mitigation project in that these plant species may have evolved certain adaptations to their locality, a factor that is more likely to ensure plant survival. Along these lines, we also encourage salvaging plant material and soil from the impact site(s) to be used in the mitigation site. We have revised the Mitigation Guidelines document to reflect this viewpoint.

Planned Soils:

Several comments requested that the document include specific soil parameters such as clay and soil content, pH, percentage of organic material, and include an acceptable topsoil specification. A commenter also suggested that the topsoil definition given in the guidelines is for 'manufactured' topsoil that is not subject to regulation and may not possess any beneficial qualities for healthy plant growth. A commenter suggested that the document provide guidance on compaction difficulties that can result from the use of high clay soils. One comment suggested that the carbon content of organic soils is 50-60% when the checklist recommends that a 4-12% carbon content be achieved. To address these comments, the document refers applicants to: Wetlands Engineering Handbook, ERDC/EL TR-WRP-RE-21, March 2000, U.S. Army Engineer Research and Development Center, Vicksburg, MS: <http://www.wes.army.mil/el/wetlands/pdfs/wrpre21/wrpre21.pdf>

Several comments suggested that hydric soils be re-used from impact areas if invasive plant species seed banks are not present. The document has been changed to reflect this

suggestion. A commenter corrected the definition of a histosol. During the reworking of the section, the word was removed from the document.

Planned Buffer:

Several commenters requested more guidance be provided with regard to buffers. However, it should be noted that future guidance that will provide more detail on buffers is one of the action items listed in the Mitigation Action Plan. This information can be at: <http://www.epa.gov/owow/wetlands/guidance>

Stream Mitigation

Most comments argued that several topics were missing from the checklist, including toxin studies, ordinary high water mark, floodplain delineations, flood storage capacity determinations, macro invertebrate sampling, inventorying existing biota, identification of erosion sources, and potential downstream impacts. In general, comments implied that the requirements for stream restoration were vague. Other comments included the discouragement of 'hard' engineering such as riprap, and the use of stream relocations as mitigation. The encouragement of using a general philosophy to improve the aquatic system, including water quality, bed stability, fish passage, and stream buffers was recommended. One comment stated that stream mitigation should be in a separate checklist. In response to these comments, both sections (within Guidelines and Checklist) were completely reconfigured to more clearly exhibit principles and methods that would better achieve the goal of the 02-02 RGL. Baseline information required has been clarified and specific examples were used. The entire section is now focused on the encouragement and use of soft engineering and biological principles during the development of the mitigation design. For technical guidance, the document now refers applicants to: The WES Stream Investigation and Streambank Stabilization Handbook, October 1997, March 2000, U.S. Army Engineer Research and Development Center, Vicksburg, MS: <http://libweb.wes.army.mil/archimages/12642.pdf>

A commenter requested that a ratio of 1:1 at the minimum be used for replacement instead of using a functional assessment. As indicated in the Mitigation Guidance, mitigation should provide at a minimum, 1:1 functional replacement, with an adequate margin of safety to reflect anticipated success. One comment stated that financial assurances and contingency plans should be secured. This comment is addressed in the section entitled "Site Protection and Financial Assurances". One commenter wanted the Corps to clarify that stream bank armoring, particularly to protect human infrastructure, generally does not constitute compensatory mitigation. The Corps agrees that in general this is true, however there may be circumstances where a comprehensive stream mitigation plan (for a large scale stream restoration project, for example) may necessitate, for practical purposes and when justified by the applicant, some areas of bank armoring. One comment requested that coir mats, biologs, and geotextiles be added to the list of "potential habitat/stabilization structures". Although the list of "potential habitat/stabilization structures" was removed from the guidance document, the Corps encourages applicants to refer to the bioengineering techniques and principles indicated in the: "The WES Stream Investigation and Streambank Stabilization Handbook," October 1997, March 2000, U.S. Army Engineer Research and Development Center, Vicksburg, MS (at the web address indicated above). A commenter stated that stream assessments should be based on bank-full conditions. The document has been changed to reflect this language. A comment states that the term

'migration barriers' is unclear. The document has been changed to reflect a clarification of the term and the encouragement of the use of fish ladders.

Site Protection and Financial Assurance

A commenter stated that the Corps should require assurances that the mitigation plan is successfully completed. We agree, and intend for these guidelines to facilitate such action. In addition, the Corps does condition its permits in order to make clear what work the permittee is required to do and when the applicant is required to do the work. We have revised the Mitigation Guidelines document to reflect this viewpoint.

A commenter stated that the Corps must require in-perpetuity protection for all compensatory mitigation sites. The New York District will require in-perpetuity protection for most compensatory mitigation sites through either an outright transfer (for restricted purposes), a conservation easement, or a deed restriction. It should be understood that although the Corps prefers outright transfers and conservation easements to deed restrictions, it is not always possible for a permittee to secure an easement holder (e.g., public entity or State-qualified not-for-profit land conservancy) for such an easement. We have revised the Mitigation Guidelines document to reflect this viewpoint.

A commenter stated that in cases where a specific locality has an established mechanism for posting bonds related to construction and monitoring of mitigation sites, the Corps should allow the use of such mechanisms. We believe that such a provision is reasonable, as may other means of financial assurance, so long as they are effective at assuring completion of the mitigation plan. We have revised the Mitigation Guidelines document to reflect this viewpoint.

A commenter stated that with regard to the statement that the "...Corps may require in-perpetuity protection for most compensatory mitigation sites," to Corps should revise the statement to read that the "...Corps *will* require in-perpetuity protection for all compensatory mitigation sites." We maintain that, in general, the New York District will require in-perpetuity protection for most compensatory mitigation offered by an applicant shall be permanently protected, and our Mitigation Guidelines document reflects this position.

A commenter stated that "[p]ermanent protection of restored and banked sites should be delegated to a land trust or government agency, preferably by title transfer or sale. Deed restrictions and easements are acceptable, but less preferable, forms of protection." We generally concur with this comment. Our preference is difference is only that we prefer outright transfers (for a restricted purpose) and conservation easements to a public body or State-approved not-for-profit land conservancy, to deed restrictions. We have revised the Mitigation Guidelines document to reflect this viewpoint.

Several commenters stated that performance bonds, letter of credit, escrow account, or other financial surety should be required for all projects, especially projects that carry a higher probability of failure. We maintain that projects that carry high probability of failure should not be attempted. However, it is our position that most and perhaps not all projects should be appropriately backed with sufficient financial assurances. Our final guidance reflects a preference for financial assurances to ensure greater success.

A commenter stated that the Corps should reward applicants who are performing successful mitigation projects with a partial release of funds, whereas another stated that the Corps should hold funds until the mitigation is complete. The fundamental goal of the Corps' mitigation guidelines is to replace the unavoidable loss of aquatic functions and values. To this end, the process should be fair, equitable, and efficient. If mitigation can be confidently assured without requiring full financial assurances, then it is reasonable to be flexible with the degree/amount of financial assurances an applicant provides in a bond or other financial instrument. We have revised the Mitigation Guidelines document to reflect this viewpoint.

A commenter asked if escrow would be required to provide financial assurance for a mitigation project and, if so, whether insurance could be substituted for an escrow fund? It is our opinion that if mitigation can be confidently assured without requiring full financial assurances, then it is reasonable to be flexible with the degree/amount of financial assurances an applicant provides in a bond or other financial instrument. More information on this subject is necessary before a decision is made with respect to this viewpoint.

A commenter stated that the Corps should encourage applicants to utilize tools such as the Property Analysis Record (PAR) developed by the Center for Natural Lands Management (CNLM) in establishing reasonable figures necessary to maintain in-perpetuity conservation easements. It is our opinion that the PAR is a useful and promising tool to be used in establishing a proper endowment for in-perpetuity management of a conservation easement. As the state-of-the-art in analysis tools evolves, so will the tools. Therefore, the PAR may not always be the best way to set a price for future management needs, but it is acceptable for our purposes and we encourage its use or the use of other comparable methodology. We have revised the Mitigation Guidelines document to reflect this viewpoint.

Monitoring Plan and Report

A commenter stated that monitoring plans should include documentation of wildlife responses to the mitigation. We agree that projects that are designed to replace lost habitat functions be required to document the response of species to the mitigation in order to gauge successful attainment of the proposed goals and objectives. One commenter suggested that the Corps should allow one season for hydrology to be established after grading of the mitigation area, prior to any shrub or tree plantings. The Corps already allows flexibility during the proposed mitigation plan review process for staggered planting sequencing, when warranted on a case-by-case basis. One commenter stated that it is important that the Corps provide feedback on the monitoring reports that are submitted and provide acknowledgement of receipt of the monitoring reports in the form of a standard letter. This commenter was also concerned about the burden on the project proponents when the Corps requires additional monitoring and remedial actions, sometimes, at the end of the required monitoring period. Another commenter stated that required mitigation/restoration projects are often not implemented (24%, as cited in *Compensating for Wetland Losses Under the Clean Water Act*, National Academies Press, 2001, 348 pp.) and of those implemented, only 21 % resulted in functionally equivalent sites. One other commenter made similar recommendations for follow-up inspections and monitoring report tracking. The Corps is committed to improved compliance efforts, including report tracking and follow-up inspections at mitigation sites, but the amount of time dedicated to these efforts is dependent on the available amount of district resources. The Corps expects that the publishing of these guidelines and checklist will provide project proponents assistance in meeting their

mitigation requirements within the given timeframes, so that extending monitoring periods would be unnecessary. Three commenters made suggestions about the length of monitoring requirements. One commenter strongly supports long-term monitoring and remediation as necessary, and one commenter supports a minimum monitoring period of five years, but believes that the period should be increased to ten years or more with the size and complexity of the mitigation project. Another commenter stated that some types of wetland mitigation should only be monitored for three years.

The Guidelines state that mitigation sites will typically have monitoring periods of five to ten years, but also indicates that establishment of larger or forested wetlands may warrant longer monitoring periods. The Corps already practices flexibility on monitoring periods on a case-by-case basis for smaller, less complex mitigation projects. The monitoring periods as described in the Mitigation Guidelines document will be reissued without change. One commenter stated that monitoring reports should be published or posted publicly for reference and for peer review. At this time, district resources do not allow for publishing of all the monitoring reports received. Monitoring reports are available for review at the district or field offices under the Freedom of Information Act procedures. One commenter is concerned that there is no definable end point to the project proponent's responsibility and no definition of a successful mitigation. The Corps disagrees that the responsibility of the project proponent with regard to a mitigation project is unclear. The Corps holds the project proponent responsible for meeting the performance standards of mitigation areas as typically set out in the Special Conditions in the permit. One commenter stated that photographs of the mitigation site should be included in the monitoring report. The Corps agrees with this suggestion and has added another Monitoring Report Element. A commenter has recommended that the information in the As-built plans be incorporated in the monitoring report. The Corps agrees with this recommendation and has amended the Guidelines.

Maintenance and Adaptive Management Plan

A commenter stated that human activity should be added to the list of potential challenges to project success stated in the draft document. We agree and have revised the document to consider the human activity as an important factor adaptively managing mitigation projects.

A commenter stated that the Corps should provide early feedback on the mitigation (monitoring) reports submitted by applicants as conditioned by the permit. Such information is necessary to adaptively manage mitigation projects and avoid lost time, effort and money. The Corps agrees and that is why it has adopted and encourages an adaptive approach to managing mitigation projects.

A commenter stated that the Corps should not allow permittees to rely on the use of chemicals or herbicides to achieve a positive outcome for the project. It is our opinion that long-term reliance on any artificial means of ecosystem support is to be discouraged. However, it is also our opinion that a total prohibition on the responsible use of artificial means of ecosystem support is not warranted, especially if a responsible (i.e., limited) use of chemicals will achieve a positive outcome for the ecosystem.

A commenter stated that mitigation requires early monitoring and intervention. We concur, and believe such an adaptive approach is necessary to ensure greater success.

A commenter stated that progress reports should be made available to the public for comment and review. We did not intend to go this far in our guidelines at this point, but are nevertheless in general agreement with the suggestion. We are currently discussing such measures between other sister agencies.

Several commenters stated that mitigation projects should be actively “managed” by a competent “restoration” specialist or site manager. It is our opinion that such measures may reduce the monitoring period for a project, but moreover it seems to make good business sense.

A commenter stated that mitigation plans should not be allowed to facilitate approval of poorly sited or designed compensatory mitigation projects. We agree, and have attempted to encourage ecologically sound results throughout this document in addition to providing reference information to these guidelines.

A commenter suggested that the applicant submit a budget to fund annual maintenance expenses over the life of the monitoring period. We believe this is a prudent measure and have incorporated it and other financial “BMPs” into our guidelines.

A commenter asked how the Corps would respond to projects accomplishing greater functional gains than proposed. We encourage applicants to exceed their goals. Some projects are considered “in compliance” in some cases when a project attains early success during the monitoring period. We believe that occasionally achieving net gains is a necessary buffer (safety margin) to the inevitable failures or losses associated with this type of work.

A commenter asked how the Corps handles mitigation projects that have been adversely impacted by natural phenomena. We have provisions within each permit that address such situations and they are intended to remain enforce.

Invasive and Other Unacceptable Plant Species

Several commenters stated that the list of plant species should be expanded and/or that specific species be removed from the list. It was also recommended that several different published lists of plant species be used as references in the document. The document has been revised by removing the list provided and supplementing that list with two websites that provide applicants lists of non-native and invasive plant species in NY and NJ that the Corps typically does not recommend planting as part of a mitigation plan.

Checklist

The formats of the guidelines and the checklist have been revised to incorporate the appropriate comments raised from the Public Notice as well as to make them both more user friendly. Specifically, several comments to revise the checklist with regards to many of the issues raised throughout this pre-amble, as well as other grammatical and general changes have been incorporated into the checklist.