US Army Corps of Engineers®

SPECIAL PUBLIC NOTICE

SAN FRANCISCO and SACRAMENTO DISTRICTS

MITIGATION AND MONITORING PROPOSAL GUIDELINES
December 30, 2004

INTRODUCTION

The Sacramento and San Francisco Districts of the Corps are jointly publishing these Mitigation and Monitoring Proposal Guidelines to update the existing Habitat Mitigation and Monitoring Guidelines published October 25, 1996 in the Sacramento District and October of 1991 in the San Francisco District. These Guidelines have been updated based upon experience, field investigations, and public input, but retain the main elements presented in the previous Guidelines.

These Guidelines apply throughout the U.S. Army Corps of Engineers' (Corps) San Francisco District, which encompasses the coastal portions of California from northern San Luis Obispo County to the Oregon border; and the Sacramento District, which covers the Central Valley of California, Nevada, Utah and western Colorado (see Figure 1). Both the San Francisco and Sacramento Districts shall herein be referred to as the "Districts." If modifications occur to the Districts' boundaries in the future, these Mitigation and Monitoring Proposal Guidelines will apply to all areas within the revised boundaries.

Overview

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (EPA) regulations (33 CFR Parts 320-331 and 40 CFR Part 230) authorize the Corps to require compensatory mitigation for unavoidable impacts to wetlands and other jurisdictional waters of the U.S. The Corps has commenced several initiatives in response to recommendations contained in the recent National Academy of Science / National Research Council publication "Compensating for Wetland Losses under the Clean Water Act," (2001) and is committed to improving the success of future compensatory mitigation projects.

After the applicant has demonstrated maximum avoidance and minimization of project impacts to waters of the U.S., Corps Districts will likely require compensatory mitigation for the remaining unavoidable impacts. While there may be other options for compensatory mitigation, these guidelines apply to development of plans for onsite and/or offsite establishment (creation), enhancement, and restoration activities, as well as mitigation bank design.

These Mitigation and Monitoring Proposal Guidelines are designed to assist the regulated public and their hired consultants with all aspects of the mitigation process. Approval of a mitigation plan is based on a demonstration that the proposed mitigation can successfully replace all lost functions and values associated with regulated impacts to waters of the U.S.

Changes from the December 31, 2003 Draft Guidelines

This Public Notice finalizes the draft guidance proposed in the Public Notice issued for public comment on December 31, 2003. Based upon comments received during the one-month comment period, we have made significant revisions to the Guidelines format. Most notably, Section I of the original Public Notice included both a section of the comprehensive report entitled "Compensating for Wetland Losses Under the Clean Water Act," from the National Research Council (NRC), and a list of ten guidelines to aid in planning and implementing successful mitigation projects ("Operational Guidelines for Creating or Restoring Wetlands that are Ecologically Self-Sustaining"; NRC, 2001). Section I, according to many commenters, created unnecessary confusion, contained too many examples of habitat types that are not represented within the boundaries of either District, and was redundant with other portions of the Public Notice. As a result, we did not include the information in this final version (however for reference, this section's content can be found in Chapter 7 of the National Academy of Science's report found at http://www.usace.army.mil/inet/functions/cw/hot_topics/nrchottopic.htm). Section II has been simplified and renamed "Section I. Mitigation Planning." Finally, we moved the annotated proposal outline from Appendix A to the main text of the final guidelines to accurately accentuate its importance in this document and mitigation planning.

Changes from Sacramento District's 1996 and San Francisco District's 1991 Guidelines

Sacramento District

There have been a number of changes to the Sacramento District's 1996 guidelines as a result of the adoption of these guidelines. The Corps policy section and mitigation-banking summary have been replaced, primarily, with a reference list of relevant regulations, guidance, and agreements. The section concerning different submittals for individual and nationwide permits has been removed. Contact information has been updated and enhanced by inclusion of links to the Districts' websites. *Section I. Mitigation Planning* has been added.

Guidelines for submittal of information on both the project and mitigation sites have been updated. Requests to submit Cowardin designations for types of jurisdictional areas and discuss proposed compensation ratios and long-term goals have been added. The success criteria section has been modified to better allow for site-specific selection of success criteria. Sections on "Maintenance During Monitoring Period" and "Long-term Management" have been added. The request to identify contingency mitigation sites has been removed. Finally, an outline for monitoring reports, and a list of common Cowardin habitat types that occur within the boundaries of the two districts, are included as appendices.

San Francisco District

The primary changes from the previous SF District Proposal Guidelines include requests for Cowardin descriptor codes, slope ratios, groundwater and soil information, aquatic functions, identification of compensation ratios (by applicant), monitoring schedule, and long-term management plans. Expanded information is requested for the monitoring and report sections.

Contact Information for Project Specific Questions:

For answers to questions regarding the interpretation of these Mitigation and Monitoring Proposal Guidelines or acceptable compensatory mitigation for a specific project, contact the Corps Project Manager responsible for your geographic area of interest:

San Francisco District Office general line	415-977-8436
Eureka Field Office general line	707-443-0855
Sacramento District Office general line	916-557-5250
Redding Office	530-223-9534
Reno Office	775-784-5304
Bountiful Office	801-295-8380
Colorado/Gunnison Basin Office	970-243-1199
Durango Office	970-375-9506
Frisco Office	970-668-9676
St. George Office	435-986-3979

References

The documents listed below have been used in creating this guidance and pertain to Corps mitigation policy. They are available for your use on the internet at www.gpoaccess.gov/legislative.html or www.usace.army.mil/inet/functions/cw/cecwo/reg/sadmin3.htm.

1. Clean Water Act Section 404 (33 USC Section 1344)
2. Rivers and Harbors Act of 1899 Section 10 (33 USC Sections 403 et seq.)
3. Environmental Protection Agency, Section 404 (b)(1) Guidelines (40 CFR Part 230)
4. Department of the Army Permit Regulations (33 CFR Parts 320-331)
5. *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*, dated 6 Feb 1990
6. *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*, dated 28 Nov 1995
7. *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*, dated 7 Nov 2000
8. *Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899*, dated 26 Dec 2002 (RGL 02-02)

Additional Information Available on the Internet

The Corps Regulatory websites also provide important information regarding Corps jurisdiction, processing of permit applications, mitigation design, vernal pools, riparian mitigation guidelines, conservation easements, operation and maintenance plans, dredging, etc.:

San Francisco District's site: www.spn.usace.army.mil/regulatory/

Sacramento District's site: www.spk.usace.army.mil/regulatory.html

GUIDELINES TABLE OF CONTENTS

I. MITIGATION PLANNING

Compensatory mitigation projects will proceed through several stages. There are specific issues the applicant must address at each stage in the process, to increase the probability of a successful compensatory mitigation project. The key stages in the development of a compensatory mitigation project are (A) Project Site Impact Assessment, (B) Compensatory Mitigation Site Selection, (C) Compensatory Mitigation Site Design, (D) Compensatory Mitigation Site Construction, (E) Long-Term Compensatory Mitigation Site Maintenance and Monitoring, and (F) Long-Term Site Management. Within each of these areas, the Corps has identified specific concerns that the applicant needs to consider in developing an adequate compensatory mitigation and monitoring plan.

A. Project Site Impact Assessment

An important aspect of any permit application is the assessment of the project site before impacts occur. An adequate assessment of site functions and values is important for determining the relative importance of the existing aquatic resources to the site and to the region or watershed. Assessment results can provide a basis for modifying pre-construction plans to avoid and/or minimize impacts to these resources. This assessment should be completed before the proposed project is designed or the proposed compensatory mitigation site is selected.

B. Compensatory Mitigation Site Selection

1. The selection of a site with suitable hydrologic conditions has been one of the most neglected aspects of compensatory mitigation planning. The National Research Council's *Compensating for Wetland Losses Under the Clean Water Act* (2001) stated that hydrological conditions, including variability in water levels and flow rates, are the primary driving force influencing wetland development, structure, functioning, and persistence. Without a naturally variable source of water (e.g., stream, lake, tidal action), hydrologic processes may not function fully. Lack of a natural

water source has been the number one physical factor leading to the low rate of success of past compensatory mitigation projects. Therefore, mitigation projects that rely on artificial hydrology are generally unacceptable.

2. Site selection should include and prioritize the following criteria:

a. Natural Hydrology. The goal should be to have the aquatic feature be supported by a self-sustaining, natural hydrologic process requiring little or no long-term maintenance. It is recommended that the applicant compare hydrologic information at the compensatory mitigation site to similar reference (i.e., high-functioning) sites in the region, as well as to the impact site for design guidance.

b. Wildlife Corridors. Where possible compensatory mitigation projects should be developed adjacent to existing high-quality habitats. Even more desirable would be the construction of a compensatory mitigation site that links two or more habitats, which had been previously separated.

c. Soil Characteristics. Many past compensatory mitigation projects did not address the development of suitable soils. Examination of soils at reference sites will provide important information on the target habitat. Thorough assessments of mitigation site soils should be conducted to determine the site's suitability for supporting the target habitat. In the case of in-kind compensatory mitigation for wetlands, soils from the impacted aquatic habitat can be used at the compensatory mitigation site.

3. Generally, the physical characteristics of the sites considered determine whether establishment (i.e., creation), restoration, enhancement, or, more rarely, preservation are viable compensatory mitigation options. The categories of compensatory mitigation, as applied to wetlands and as defined in Regulatory Guidance Letter 02-02, are:

a. *Establishment (Creation)*: The manipulation of the physical, chemical or biological characteristics present to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Establishment results in a gain in wetland acres.

b. *Restoration:* The manipulation of the physical, chemical or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into:

i. Re-establishment: The manipulation of the physical, chemical or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres.

ii. Rehabilitation: The manipulation of the physical, chemical or biological characteristics of a site with the goal of repairing natural or historic functions of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres.

c. *Enhancement:* The manipulation of the physical, chemical or biological characteristics of a wetland (undisturbed or degraded) site to heighten, intensify or improve specific function(s) or to change the growth stage or composition of the

vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. This term includes activities commonly associated with enhancement, management, manipulation and direct alteration.

d. Protection/Maintenance (Preservation): The removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This term includes the purchase of land or easements, repairing water control structures or fences, or structural protection such as repairing a barrier island. This term also includes activities commonly associated with the term preservation. Preservation does not result in a gain of wetland acres and will be used as mitigation only in exceptional circumstances.

C. Compensatory Mitigation Site Design

1. Use a reference site to guide the design of mitigation. A reference site is a functioning aquatic system containing habitat that functions equal to or preferably better than the impact site and should be used to guide both the mitigation design and the success criteria of the final compensatory mitigation plan. The reference site may be the impact site or a similar site near the proposed mitigation site that supports the target habitat.

2. There are several important features to any successful compensatory mitigation design or plan. Each aspect of the plan must be identified in detail and explained clearly. Although there may be variation in the number of items required for a particular plan, those identified below should be assumed to be the minimum. The Corps strongly recommends that contents of written submittals follow the format provided in "Section II. Mitigation and Monitoring Proposals."

a. *Clearly Define the Purpose of the Compensatory Mitigation Project*. The purpose of the compensatory mitigation project shall be clearly identified and include specific statements about the type(s) of habitat (and associated functions and values) impacted by constructing the proposed project, the functions and values that would be replaced at the proposed compensatory mitigation site, and any other functions and/or values that are desired (e.g., endangered species habitat, water quality functions, etc.).

b. *Develop a Comprehensive Hydrology Component*. For wetlands, information should be developed on depth, duration, and timing of ponding/saturation (inland areas); porosity of underlying soils; tidal ranges and frequencies (estuarine and marine areas); groundwater levels and fluctuations; mitigation site topography; and whether urban stormwater runoff is a water source. Provide information about the amount and the variability of water available to the site in an average rain year (October 1 – September 30). For channels, information should be developed on longitudinal profiles, frequency and depth of flooding (usually for 2-year, 5-year, 10-year, and 100-year storms), bank-full (channel-forming) flows under current and projected conditions, relevant cross-sections, substrate in the project/reference reach, channel history, upstream watershed conditions, and water-rights availability (if applicable).

c. *Develop a Complete Grading Plan Making Use of the Hydrology Data*. Elevations are critical to design success; grading plans should depict no coarser than one-foot contours. Topographic variation should often be incorporated into the design to maximize aquatic habitat diversity. Examine adjacent or nearby viable habitats as a

reference.

d. *Determine the Adequacy of the Soils to Support the Target HabitatTtypes*. It is important to consider whether the soils will support the target aquatic habitat. Additionally, consider whether site preparation activities will significantly alter the site's ability to support the target aquatic habitat type. Finally, determine whether soil amendments will be necessary for long-term habitat development (e.g., organic matter, nitrogen, etc.).

e. *Develop a Draft Plant Palette Based on the Compensatory Mitigation Project Purpose, Soil Types, and Hydrology*. Identify tree, shrub, and herbaceous species to be planted, the source of the material, and the number and size of individual plants. Plant stock should be obtained from areas as near to the compensatory mitigation site as possible, to preserve the genetic integrity of the area.

f. *Propose Realistic Success Criteria Based on the Purpose of the Compensatory Mitigation, Design of the Site, and Functional Assessment Criteria*. Develop measurable success criteria, consistent with the purpose and goals of the compensatory mitigation project, that are achievable by the end of the maintenance and monitoring period (generally five years to ten years). Success criteria in compensatory mitigation projects have included percent canopy cover, percent plant survival, plant vigor, percent of native species, period of inundation, stability of designed hydrologic features, wildlife usage and plant heights.

g. *Develop a Specific Maintenance and Monitoring Program Including Contingency Measures.* Cover all subjects in the Guidelines that are appropriate to your project. The discussion of potential contingency measures should be brief, but acknowledge that should all or a portion of the required mitigation fail, additional measures may be necessary to fulfill the permittee's mitigation responsibility. If all feasible mitigation areas at the original mitigation location have already been used, a new off site location may be necessary to complete the mitigation.

3. In general, the Corps prefers that the compensatory mitigation site be constructed prior to or concurrently with the project construction. If compensatory mitigation will not be constructed until after project impacts, the Corps will likely increase the replacement ratio, to minimize temporal losses of functions and values associated with project impacts.

D. Compensatory Mitigation Site Construction

The permittee will not begin construction until the Corps approves the final compensatory mitigation and monitoring plan. The mitigation implementation process will normally require on-site management of construction personnel by one or more of the permittee's representatives, who have complete knowledge of the compensatory mitigation and monitoring plan and an understanding of soil science, hydrology, and botany, horticulture, or plant ecology. Sensitive areas should be staked, flagged or fenced to preclude unauthorized construction impacts. The permittee is responsible for the successful implementation of the compensatory mitigation. Any significant deviations identified during construction must be approved by the Corps. Additionally, consideration should be given to exotic species control during site preparation to minimize future maintenance and ensure successful mitigation. Personnel should consider removal of exotic species prior to grading and take invasive plant material from the site; in some circumstances, it may be necessary to remove the exotic seed banks by scraping and disposing the top few inches of soil.

E. Long-Term Compensatory Mitigation Site Maintenance and Monitoring

1. Develop specifics regarding the type and timing of maintenance and monitoring. Detail how often and when it will occur.

2. After the site has been graded and planted, the maintenance and monitoring phase of the compensatory mitigation project begins immediately. There are many invasive problematic plant species that will readily colonize a recently disturbed site. A proactive program to remove these plants upon discovery is usually advisable to allow establishment of desirable vegetation. As the target vegetation becomes established, the need for invasive plant species removal will likely lessen.

3. An important aspect of the maintenance and monitoring phase of nearly all compensatory mitigation projects is ensuring the appropriate depth, duration, and timing of onsite water. It is recommended that the permittee compare hydrologic information at the compensatory mitigation site to reference (i.e., high-functioning) sites in the region.

4. Contingency measures should be considered in mitigation site design. If approved success criteria are not met, the permittee must prepare an analysis of the likely cause(s) of failure(s) and propose remedial actions for Corps approval. Consider what sources of funding will be available to ensure the required compensatory mitigation occurs successfully. Contingency measures could include selection of an alternative location.

5. Monitoring reports are required for all mitigation sites. Propose annual dates that monitoring reports will be provided to the Corps. Appendix C provides an outline of what content should be provided in the specific pages of the monitoring report. The Corps recognizes there may be cases where this outline would not be practical (for very small, large, or complex compensatory mitigation projects). Failure to submit complete and timely monitoring reports could result in suspension of the permit or requirements for additional compensatory mitigation. Non-compliance with Corps permit conditions, which can result in additional compensatory mitigation requirements, may be subject to the Corps' Enforcement Procedures (33 CFR Part 326).

F. Long-Term Site Management

1. Protection of mitigation sites is usually required "in perpetuity" in keeping with the mitigation goals. The mitigation and monitoring plan must include the identification of a long-term manager/owner (usually a non-profit or a governmental agency), and should include a conservation easement or other documentation of long-term protection and a well-designed long-term management plan.

2. The permittee is usually required to provide a realistic endowment or other financial assurance to cover long-term maintenance activities.

SECTION II. RECOMMENDED PROPOSAL CONTENTS

A. Table of Contents

B. Responsible Parties: Provide names, titles, addresses, and phone numbers of responsible parties including contact persons.

1. ***Applicant/Permittee:*** The project proponent, not consultant, should be listed.

2. ***Applicant's Designated Agent*** (if any)

3. ***Preparer(s) of the Proposal/Plan***

C. Project Requiring Mitigation

1. ***Location:*** Describe location and provide: a) road map with site location clearly shown, and b) USGS quad map with project site and watershed outlined (clear photocopies are acceptable).

2. ***Brief Summary of Overall Project:*** In a few paragraphs, describe the overall project for which a permit or authorization is required. Include type of development (or other work), project size, and a brief projected schedule of project construction.

3. **Site Characteristics:**

   a. *Jurisdictional Areas* – Identify those jurisdictional areas as shown on the approved delineation to be directly or indirectly affected by the project. Provide an appropriately sized topo base map with jurisdictional areas and impacts clearly shown (may be same map as under "1." above). Indicate on the map whether the jurisdictional areas are wetlands and/or other waters. Also provide a table indicating acreage of wetland impacts by habitat common name with Cowardin designation, and linear feet and width of impacts to streams and/or tributaries.

   b. *Aquatic Functions* - Describe functions of aquatic features that will be lost and/or directly or indirectly impacted. This may include, but is not limited to, water filtration, sediment storage, flood retention, wildlife habitat, endangered species habitat, etc. (For further information, see http://www.epa.gov/watertrain/wetlands/).

   c. *Hydrology/Topography* – Describe hydrology and topography, including slope ratios of wetland features and stream banks, and identify the water's source, frequency, duration and depth of inundation for the site. Indicate groundwater level(s), if known, and significant pollutants.

   d. *Soils/Substrate* – Describe texture, organic matter content, permeability, and presence of restrictive layers in aquatic features.

   e. *Vegetation* – The dominant plant communities, as well as special status plant species, of each stratum in the vegetated plot should be identified. Provide a map of the dominant plant communities.

f. *Threatened/Endangered Species* – Identify any federally-listed (including proposed) species found on or near the site for which suitable habitat is present, including whether the site is within designated critical habitat.

D. Mitigation Design

1. *Location* – Describe location and provide: a) road map with site location clearly shown, and b) USGS quad map with project site outlined. Clear photocopies are acceptable.

2. *Basis for Design:* Provide a concise summary of the rationale for choosing the proposed type(s) and location(s) of mitigation.

3. *Characteristics of Design Reference Site* (if different from impact site):

a. *Jurisdictional Areas* - Provide a jurisdictional determination of the reference site(s) with identified sample plots that are large enough to capture the desired aquatic design characteristics.

b. *Aquatic Functions* – Describe functions of the reference aquatic site. This may include but is not limited to, water filtration, sediment storage, flood retention, wildlife habitat, endangered species habitat, etc.

c. *Hydrology/Topography* – Describe hydrology and topography, including slope ratios of wetland features and stream banks, and identify the water's source, frequency, duration and depth of inundation for the site. Indicate groundwater level(s) if known and significant pollutants.

d. *Soils/Substrate* – Describe texture, organic matter content, permeability, and presence of restrictive layers in aquatic features.

e. *Vegetation* – The dominant plant communities, as well as special status plant species, of each stratum in the vegetated plot should be identified.

4. Proposed Mitigation Site

a. *Location* – Describe location, indicating distance from project site, if applicable. Provide the following maps: a) site location on a road map, and b) original or copy of USGS quad map with mitigation location outlined.

b. *Ownership Status* – Indicate who owns the proposed mitigation site. If different from permit applicant(s), describe the property's availability and easement history.

c. *Jurisdictional Areas* (if any) – Provide a proposed jurisdictional map of the site. Indicate what portions of the jurisdictional areas, if any, are to be filled and/or altered under the mitigation proposal.

d. *Aquatic Functions* (if any) – Describe expected functions and values of any existing aquatic features on the mitigation site. This may include, but is not limited to, water filtration, sediment storage, flood retention, wildlife habitat, endangered species habitat, etc.

e. Hydrology/Topography – Describe the current hydrology and topography of the site, including intended water source for mitigation features.

f. *Soils/Substrate* – Describe overall site series and existing channel substrate (if applicable).

g. Vegetation –Describe and provide a map of the existing dominant plant communities, as well as any special status plant species. Also provide a table indicating approximate acreage of the habitats.

h. Present and Historical Uses of Mitigation Area - Briefly describe all known present and historical uses of mitigation area. On a plan view, indicate any pipelines, power lines, roads, encroachments, or easements. Also show distance and location of nearest structures, if any, on the mitigation property or on any properties adjoining the mitigation project. Give all present and proposed zoning designations for mitigation site, including city and county.

g. Present and Proposed Uses of All Adjacent Areas - Briefly describe all known present and proposed uses and zoning designations of all property sharing a common border with the proposed mitigation site.

5. Created/Restored Habitat(s)

a. Compensation Ratios – Provide a table indicating the ratio(s) of impact wetland acreage and/or linear feet of channel to compensation acreage and/or linear feet of channel, both overall and by aquatic feature type.

b. Long-Term Goal(s) – Describe the target habitat to be created/restored. Most mitigation designs are aimed at a habitat with certain characteristics that will not exist at the site until long after the monitoring period has ended. Please describe the projected state of the mitigation area in 10 to 30 years following implementation.

c. Aquatic Functions – Describe expected functions of the compensatory aquatic features.

d. Hydrology/Topography – Provide a hydrologic budget that identifies source, duration, volume and direction of water flow for the proposed mitigation feature(s) during the average climatic year. Provide information on the feature's hydrologic connectivity to downstream tributaries and navigable waters, as applicable. If the mitigation site is targeting a saturated, flooded or ponded wetland, an estimation of the average period of saturation, ponding or flooding should be included, as well as a wetland watershed map.

Include a grading plan indicating intended slope ratios of wetlands and/or stream banks and overall area of disturbance.

e. Soils/Substrate – Describe suitability of soils/substrate at intended compensation locations for creation/restoration of aquatic features.

f. Vegetation – Describe target plant communities and species. Provide a proposed planting plan.

E. Success Criteria and Monitoring

1. Success Criteria – Provide a table of success criteria. Quantifiable success criteria are used to determine completion of a permittee's mitigation responsibilities and are proposed by the applicant for Corps approval. Meeting these criteria will indicate that the mitigation area is progressing well towards replacement of lost functions and achievement of the long-term mitigation goals. The criteria should address each major aspect of the project, including hydrological success, establishment of appropriate vegetation, and habitat establishment.

2. Monitoring

a. *Methods* – Explain why each method has been chosen to evaluate progress in relation to each success criterion. The appropriateness of a method will depend on the objective it is addressing and the characteristics of the feature being surveyed. Describe sampling methods used. Include size of sample unit, number of samples. If using transects for assessment of vegetation, provide a map of the mitigation area(s) showing intended transect lines.

b. *Monitoring Schedule* – Monitoring should be tied to the appropriate growing, tidal or hydrology cycle rather than the point at which implementation happens to occur. Monitoring will generally not be considered to be "first year" monitoring until one full growing season (for vegetation) or target activity period (for hydrology/geomorphology) has passed following completion of installation. Also, although in many situations it is crucial to monitor all project components during the first five years or so, this is not necessarily true for every project. In some cases, it is not appropriate to begin quantitatively monitoring one or another component until a few years after implementation. In other cases it may be necessary to do annual monitoring for the first four to six years, and then monitor every other year for the remainder of the monitoring period. (However, in years where formal monitoring reports are not required, on-site inspections and documentation of site conditions should still occur.)

c. *Photo-Documentation* – In addition to quantitative methods, ground and/or aerial photos can be used to illustrate year-to-year progress of the overall project. Ground photos should generally be panoramic, and taken from a high point relative to the mitigation site such that photos taken in later years will not be obscured by developing vegetation. All such photos should be taken from the exact same point every year to allow for inter-annual comparison. If aerial photos are being used for measurements, they should be directly vertical and have identifiable ground-references to provide a reasonably accurate scale. Copies of color photos should be done in color.

F. Implementation Plan

1. ***Site Preparation***

a. *Grading Implementation* – Describe equipment, procedures, access paths, etc., if they affect aquatic resources.

b. *Avoidance Measures* – Describe any measures used to avoid sensitive areas outside of the grading plan.

c. Soil Disposal – Indicate storage location, if any, and ultimate destination of any excavated materials.

d. Soil Treatment – Indicate any soil modification(s) planned for the mitigation site, including spreading of inoculum. Also indicate source, storage location, storage duration, and intended placement of any soil to be used.

e. Pest Plant Removal – Describe method(s) to be used to remove any pest plants from the mitigation site.

f. *Construction Monitor* – Provide a statement that a person/firm familiar with the mitigation/monitoring plan will supervise all site phases of mitigation construction. This person should have authority to direct equipment operators, and should submit a summary report to the Corps documenting construction observations and any problems that arose during construction.

2. Planting/Seeding

a. Planting Plan – Provide a table of species to be planted and indicate geographic source of plants (should be as local as possible), type of propagules to be used, and season in which seeding/planting/transplanting is to be done. Include size and quantity of propagules and/or intended spacing.

b. Nature and Source of Propagules – Indicate types, sizes, and sources of propagules. Seeds, seedlings, canes, young plants and transplants should be from as local a stock as possible. For transplant propagules, describe method, location of harvest site, and duration of storage, if applicable

3. Irrigation - Most mitigation projects should become hydrologically self-sustaining. The function of irrigation in the early years of a project is to give new vegetation a head start at becoming established. Describe any proposed irrigation methods, including estimated frequency, and indicate month(s) in which it is to occur. Also indicate water source(s) for irrigation. In arid climates, mitigation planning should include contingency irrigation in case of drought. In most cases, irrigation is usually confined to the first 2-3 years after plant installation and success criteria are not considered met until at least two years have passed since irrigation ceased.

4. *Implementation Schedule* - Provide a schedule showing intended timing (by month) of site preparation, any seed/topsoil storage, seed/topsoil application, and plantings**.**

G. Maintenance during Monitoring Period

1. Maintenance Activities

a. *Overall* – Describe planned maintenance activities (e.g. inspection of irrigation system, inspection of water structure(s), erosion control, weeding, etc.). Note that irrigation-system failure is a common source of difficulties in the early years of a project. Many of these problems can be avoided by relatively frequent inspections of the system during the dry season in the first couple of years.

b. *Pest Species Control* - Identify any pest species (plant and/or animal) that might cause problems on the site, and provide a control plan for these species if appropriate. Indicate the critical threshold of disturbance that will trigger the implementation of control methods.

2. Maintenance Schedule – Provide a table showing proposed schedule of frequency of maintenance inspections over the life of the project.

H. Proposed Monitoring Reports

1. Due Dates - The applicant must identify an annual due date for reports (i.e., month and day).

2. As-Builts – A topographic survey of the as-built mitigation area should be submitted to the Corps within 6 weeks of completion of mitigation construction. The Corps will decide the appropriate scale of topographic survey on a case-by-case basis.

3. Annual Reports

a. *File Number* – Include the Corps permit/file number on the cover and title page of all reports and correspondence.

b. *Content*s – The required contents for annual reports is listed below:

i. Years of full monitoring – Appendix C describes the content of annual monitoring reports.

ii. Years of partial monitoring, where required - Occasionally, due to project-specific factors, it is appropriate to perform a reduced monitoring program for one or more monitoring years. The nature and extent of this monitoring would be described in permit documents, and the reporting is usually in the form of a letter.

iii. Final monitoring report – In the final monitoring report, include a delineation of any constructed wetlands, in addition to the normal content of a monitoring report.

I. Potential Contingency Measures

1. Initiating Procedures – If an annual performance goal is not met for all or any portion of the mitigation project in any year, or if the final success criteria are not met, the permittee should prepare an analysis of the cause(s) of failure and propose remedial action for Corps approval. Remedial actions could range from replanting, to relocating the mitigation site.

2. Contingency Funding Mechanism - Indicate what funds will be available to pay for planning, implementation, and monitoring of any contingency procedures that may be required and present all necessary assurances that the funds will remain available until success criteria have been achieved.

J. Completion of Mitigation Responsibilities

1. ***Notification*** – When the required monitoring period is complete and the permittee believes that the final success criteria have been met, the permittee shall notify the Corps when submitting the proposed final report. For mitigation plantings, final success criteria will not be considered met until a minimum of two years after all maintenance (e.g. irrigation, replanting, rodent control, fertilization) has ceased**.**

2. ***Corps Confirmation*** **-** Following receipt of the proposed final report, the Corps will either confirm the successful completion of the mitigation obligation or require additional years of monitoring. The permittee is not released from any mitigation obligation until written notice of completion is received from the Corps**.**

K. Long-Term Management

1. ***Property Ownership*** **-** Identify the owner of the mitigation site following completion of mitigation monitoring period.

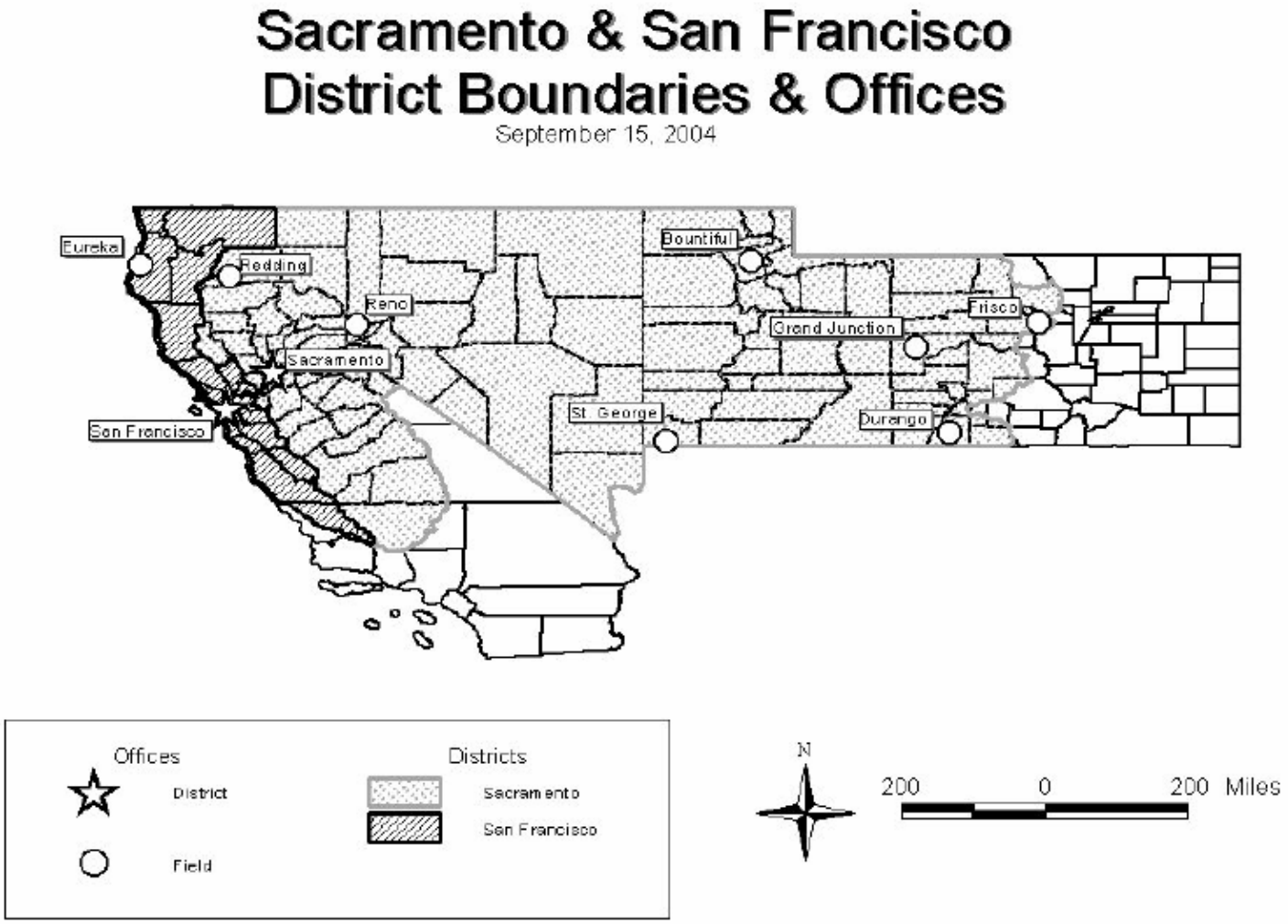
2. ***Management Plan***

   a. *Resource Manager.* Identify the entity that will provide the resource management for the site following mitigation sign-off.

   b. *Management Approach.* The long term management plan should describe any proposed grazing, fencing, fire-management activities, provisions for public access, invasive exotic plant control program (if applicable), annual reporting, and any other proposed activities.

3. ***Site Protection*** **-** Long-term site-protection mechanism (e.g., ownership by conservation organization, conservation easement, etc.) should be included. Indicate responsible parties and funding mechanism. A Property Analysis Record (PAR) analysis or similar method should also be used to determine how much money will be needed to manage the property over the long term. The long-term manager should be in agreement with the amount provided.

Map: Sacramento and San Francisco Districts



APPENDIX A1. RECOMMENDED PROPOSAL CONTENTS

A. Table of Contents

B. Responsible Parties

1. ***Applicant/Permittee***
2. ***Applicant's Designated Agent***
3. ***Preparer(s) of the Proposal/Plan***

C. Project Requiring Mitigation

1. ***Location***
2. ***Brief Summary of Overall Project***
3. ***Site Characteristics:***

   a. *Jurisdictional Areas*
   b. *Aquatic Functions*
   c. *Habitat Types*
   d. *Hydrology/Topography*
   e. *Soils/Substrate*
   f. *Vegetation*
   g. *Threatened/Endangered Species*

D. Mitigation Design

1. ***Location***
2. ***Basis for Design***
3. ***Characteristics of Design Reference Site (if different from impact site):***

   a. *Jurisdictional Areas*
   b. *Aquatic Functions*
   c. *Hydrology/Topography*
   d. *Soils/Substrate*
   e. *Vegetation*

4. ***Proposed Mitigation Site***

   a. *Location*
   b. *Ownership Status*
   c. *Jurisdictional Areas (if any)*
   d. *Aquatic Functions (if any)*
   e. *Hydrology/Topography*
   f. *Soils/Substrate*
   g. *Vegetation*
   h. *Present and Historical Uses of Mitigation Area*
   i. *Present and Proposed Uses of All Adjacent Areas*

5. Created/Restored Habitat(s)

a. Compensation Ratios
b. Long-Term Goal(s)
c. Aquatic Functions
d. Hydrology/Topography
e. Soils/Substrate
f. Vegetation

E. Success Criteria and Monitoring

1. Success Criteria
2. Monitoring

a. Methods
b. Monitoring Schedule
c. *Photo-Documentation*

F. Implementation Plan

1. Site Preparation

a. Grading Implementation
b. Avoidance Measures
c. Soil Disposal
d. Soil Treatment
e. Pest Plant Removal
f. Construction Monitor

2. Planting/Seeding

a. Planting Plan
b. Nature and Source of Propagules

3. Irrigation
4. Implementation Schedule

G. Maintenance during Monitoring Period

1. ***Maintenance Activities***

a. Overall
b. *Pest Species Control*

2. Maintenance Schedule

H. Proposed Monitoring Reports

1. Due Dates
2. As-Builts
3. Annual Reports

a. File Number
b. Contents
i. Years of full monitoring
ii. Years of partial monitoring, where required
iii. Final monitoring report

I. Potential Contingency Measures

1. Initiating Procedures
2. Contingency Funding Mechanism

J. Completion of Mitigation Responsibilities

1. Notification
2. Corps Confirmation

K. Long-Term Management Plan

1. Property Ownership
2. Management Plan

a. Resource Manager.
b. Management Approach.

3. Site Protection

APPENDIX A2. SUMMARY LIST OF MAPS, TABLES, AND SCHEDULES FOR SUBMISSION WITH PROPOSALS (This is a minimum list. It is only necessary to submit the items that apply to your project. Add additional items as needed.)

A. Maps

1. Project Requiring Mitigation

a. Road Map
b. USGS Map
c. Approved Jurisdictional Map
d. Habitat Map

2. Mitigation Design – Reference Site

a. Road Map
b. USGS Map
c. Proposed Jurisdictional Map for Reference Site

3. Mitigation Design – Mitigation Site

a. Road Map
b. USGS Map
c. Proposed Jurisdictional Map
d. Vegetation/Habitat Map
e. Plan View Showing Distance to and Location of Nearest Structures

4. Mitigation Design - Created/Restored Habitat

a. Wetland Watershed Map
b. Grading Plan
c. Planting Plan

B. Tables

1. Impact Acreage
2. Impact vs. Mitigation Acreage/Linear Feet
3. Success Criteria
4. Species to Be Planted

C. Schedules

1. Monitoring
2. Implementation
3. Maintenance Inspections

APPENDIX B. FORMAT INFORMATION

A. Reports/Proposals

1. Headings

   All cover, title page, or letter headings must contain the Corps File Number and the date of the document.

2. Contributor Page

   List all persons who prepared plan, did monitoring, and/or wrote or edited the text.

3. Distribution Page

   List names, titles, and companies/agencies of all persons receiving a copy of the report.

4. Binding

   All reports and proposals should be single, stand-alone, separately bound documents. Except for full-size drawings, all materials submitted should be, or be folded to, 8 ½" x 11". Do not submit reports in three-ring binders as they do not work with our filing system. Please bind your final submittal with this in mind.

B. Figure Format

All maps and plans submitted should be legible, complete, clear, and at the appropriate scale. Each should include the following:

1. Title Block.

2. Date of Preparation.

3. Date(s) of any Modifications.

4. 1" Margin at Top of Sheet.

5. North Arrow (Plan Views).

   The orientation of the map on the page (as it is read) should be the same for all maps submitted. By convention, North will normally be toward the top of the page.

6. Scale.

   Base topo maps should be full-sized (1 inch = 100 feet or less, 1 inch = 200 feet for very large projects).

7. Datum.

   Reference elevation datum must be indicated on both plan and section views.

8. Jurisdictional Boundaries

Tidal waters – MLLW, MHW, HTL
Non-tidal waters (stream channels) – OHW
Wetlands – boundaries

9. Legend

Identify all symbols, patterns or screens used. If color figures are used, information should be understandably presented in a form that is reproducible in black and white.

APPENDIX C. MONITORING REPORT OUTLINE

I. Monitoring Report Content

A. Project Information

1. Project name
2. Applicant name, address, and phone number
3. Consultant name, address, and phone number (if appropriate)
4. Corps permit file number
5. Acres of impact and type(s) of habitat impacted
6. Date project construction commenced
7. Indication of mitigation monitoring year (i.e. first, second, third, etc.)
8. Amount and information on any required performance bond or surety, if any

B. Compensatory Mitigation Site Information

1. Location of the site (regional map may be appropriate)
2. Specific purpose/goals for the compensatory mitigation site
3. Date mitigation site construction and planting completed
4. Dates summary of previous maintenance and monitoring visits
5. Name, address, and contact number of responsible parties for the site
6. Summary of remedial action, if any

C. Location Map

D. Site Map (usually no larger than 11 x 17 unless a different scale is requested by the project manager). The map should include the following information:

1. Habitat types as described in the approved mitigation plan
2. Locations of any photographic record stations
3. Landmarks
4. Location of sample points

E. List of Corps-Approved Success Criteria

F. Tabulated Results of Monitoring Visits, Including Previous Years, Versus Success Criteria

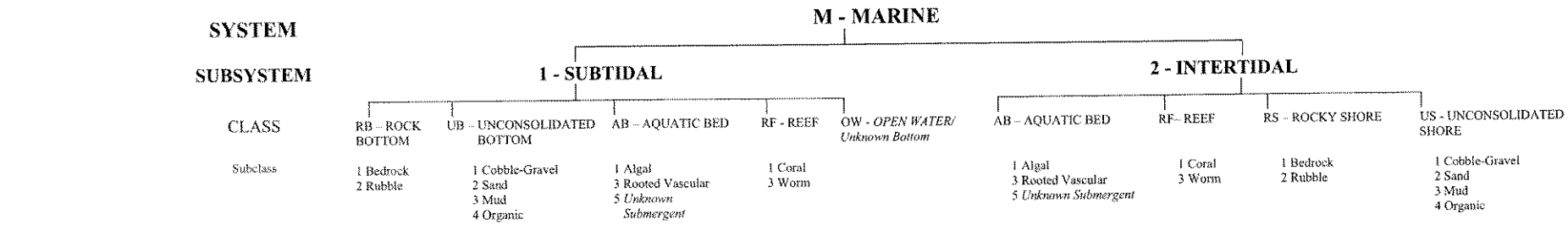
G. Summary of Field Data Taken to Determine Compliance with Success Criteria

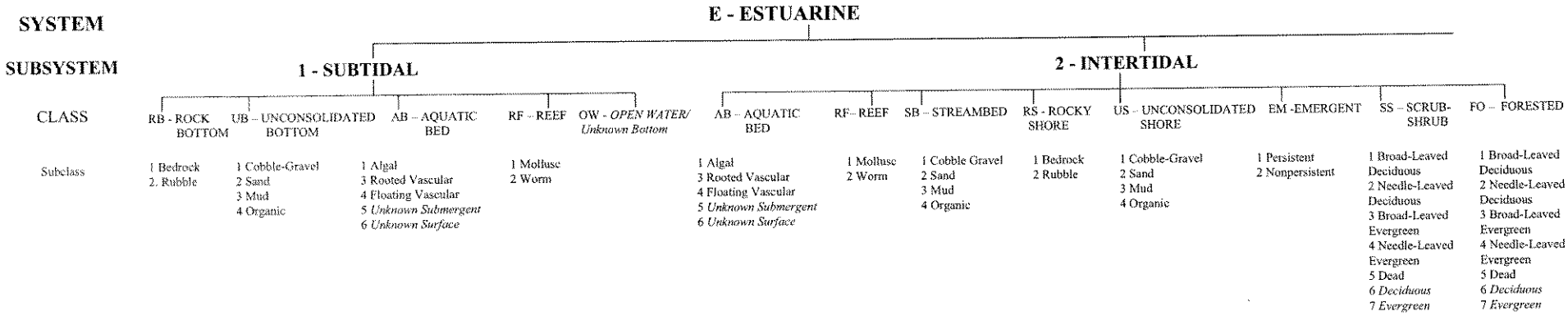
H. Problems Noted and Proposed Remedial Measures

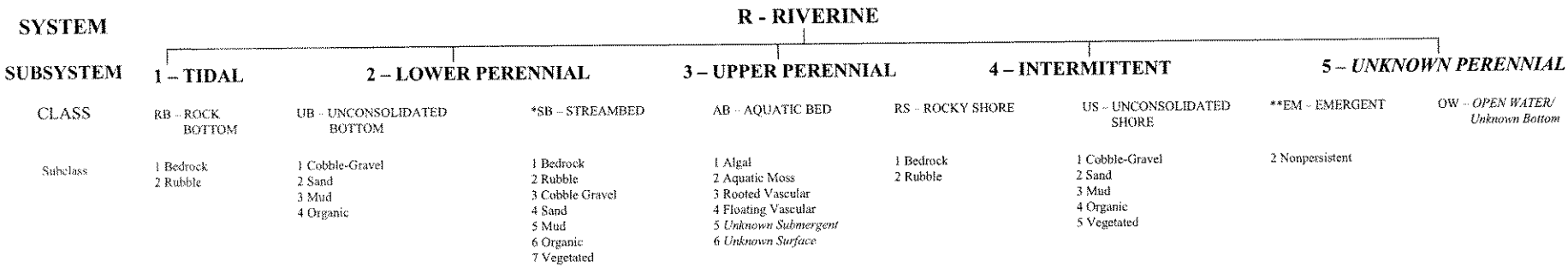
II. Appendices

A. ***Original Data Sheets and Technical Appendices***, as required by the Corps project manager
B. ***Photographic Record of the Site*** during most recent monitoring visit at record stations

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION







* STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
** EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS.

Classification of Wetlands and Deepwater Habitats of the United States
Cowardin ET AL. 1979 as modified for National Wetland Inventory Mapping Convention

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

SYSTEM: L- LACUSTRINE

SUBSYSTEM: 1 - LIMNETIC

CLASS	Subclass
RB – ROCK BOTTOM	1 Bedrock 2. Rubble
UB – UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB – AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
OW – *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 2 - LITTORAL

CLASS	Subclass
RB – ROCK BOTTOM	1 Bedrock 2. Rubble
UB – UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB – AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
RS – ROCKY SHORE	1 Bedrock 2. Rubble
US – UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
EM – EMERGENT	2 Nonpersistent
OW – *OPEN WATER/ Unknown Bottom*	

SYSTEM: P - PALUSTRINE

CLASS	Subclass
RB – ROCK BOTTOM	1 Bedrock 2. Rubble
UB – UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB – AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
US – UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
ML – MOSS-LICHEN	1 Moss 2 Lichen
EM – EMERGENT	1 Persistent 2 Nonpersistent
SS – SCRUB-SHRUB	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*
FO – FORESTED	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*
OW – *OPEN WATER/ Unknown Bottom*	

MODIFIERS

In order to more adequately describe the wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal

- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal

- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Exposed
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity

- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity

- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water

- a Acid
- t Circumneutral
- i Alkaline

SOIL

- g Organic
- n Mineral

SPECIAL MODIFIERS

- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

NOTE: Italicized terms were added for mapping by the National Wetlands Inventory program.