US Army Corps of Engineers®

REGULATORY GUIDANCE LETTER

No. 02-2 **Date:** December 24, 2002

SUBJECT: 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

1. Purpose and Applicability:

a. Purpose: Under existing law the Corps requires compensatory mitigation to replace aquatic resource functions unavoidably lost or adversely affected by authorized activities. This Regulatory Guidance Letter (RGL) 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. Relevant laws, regulations, and guidance are listed in Appendix A. This guidance does not modify existing mitigation policies, regulations, or guidance. However, it does supercede RGL 01-1 that was issued October 31, 2001. Districts will consider the requirements of other Federal programs when implementing this guidance.

b. Applicability: This guidance applies to all compensatory mitigation proposals associated with permit applications submitted for approval after this date.

2. General Considerations: Districts will use watershed and ecosystem approaches when determining compensatory mitigation requirements, consider the resource needs of the watersheds where impacts will occur, and also consider the resource needs of neighboring watersheds. When evaluating compensatory mitigation plans, Districts should consider the operational guidelines developed by the National Research Council (2001) for creating or restoring ecologically self-sustaining wetlands. These operational guidelines, which are in Appendix B, will be provided to applicants who must implement compensatory mitigation projects.

a. Watershed Approach: A watershed-based approach to aquatic resource protection considers entire systems and their constituent parts. Districts will recognize the authorities of, and rely on the expertise of, tribal, state, local, and other Federal resource management programs. During the permit evaluation process, Districts will coordinate with these entities and take into account zoning regulations, regional council and metropolitan planning organization initiatives, special area management planning initiatives, and other factors of local public interest. Watersheds will be identified, for accounting purposes, using the U.S. Geologic Survey's Hydrologic Unit Codes. Finally, applicants will be encouraged to provide compensatory mitigation projects that

include a mix of habitats such as open water, wetlands, and adjacent uplands. When viewed from a watershed perspective, such projects often provide a greater variety of functions.

b. Consistency and Compatibility. Districts will coordinate proposed mitigation plans with tribes, states, local governments, and other Federal agencies consistent with existing laws, regulation, and policy guidance to ensure that applicants' mitigation plans are consistent with watershed needs and compatible with adjacent land uses. Districts will evaluate applicants' mitigation proposals giving full consideration to comments and recommendations from tribes, states, local governments, and other Federal agencies. Districts may coordinate on a case-by-case basis during the application evaluation process, or on programmatic basis to promote consistent and timely decision making.

c. Impacts and Compensation: Army regulations require appropriate and practicable compensatory mitigation to replace functional losses to aquatic resources, including wetlands. Districts will determine what level of mitigation is "appropriate" based upon the functions lost or adversely affected as a result of impacts to aquatic resources. When determining "practicability," Districts will consider the availability of suitable locations, constructibility, overall costs, technical requirements, and logistics. There may be instances where permit decisions do not meet the "no overall net loss of wetlands" goal because compensatory mitigation would be impracticable, or would only achieve inconsequential reductions in impacts. Consequently, the "no overall net loss of wetlands goal" may not be achieved for each and every permit action, although all Districts will strive to achieve this goal on a cumulative basis, and the Corps will achieve the goal programmatically.

d. Measuring Impacts and Compensatory Mitigation. The Corps has traditionally used acres as the standard measure for determining impacts and required mitigation for wetlands and other aquatic resources, primarily because useful functional assessment methods were not available. However, Districts are encouraged to increase their reliance on functional assessment methods. Districts will determine, on a case-by-case basis, whether to use a functional assessment or acreage surrogates for determining mitigation and for describing authorized impacts. Districts will use the same approach to determine losses (debits) and gains (credits) in terms of amounts, types, and location(s) for describing both impacts and compensatory mitigation.

1. **Functional Assessment**: The objective is to offset environmental losses resulting from authorized activities. The ecological characteristics of aquatic sites are unique. Therefore, when possible, Districts should use a functional assessment by qualified professionals to determine impacts and compensatory mitigation requirements. Districts should determine functional scores 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. When a District uses a functional assessment method, e.g., a Hydrogeomorphic Assessment or Wetland Rapid Assessment Procedure, the District will make the method available to applicants for planning mitigation.

2. **Functional Replacement**: For wetlands, the objective is to provide, at a minimum, one-to-one functional replacement, i.e., no net loss of functions, with an adequate margin of safety to reflect anticipated success. Focusing on the replacement of the functions provided by a wetland, rather than only calculation of acreage impacted or restored, will in most cases provide a more accurate and effective way to achieve the environmental performance objectives of the no net loss policy. In some cases, replacing the functions provided by one wetland area can be achieved by another, smaller wetland; in other cases, a larger replacement wetland may be needed to replace the functions of the wetland impacted by development. Thus, for example, on an acreage basis, the ratio should be greater than one-to-one where the impacted functions are demonstrably high and the replacement wetlands are of lower function. Conversely, the ratio may be less than one-to-one where the functions associated with the area being impacted are demonstrably low and the replacement wetlands are of higher function.

3. **Functional Changes**: Districts may account for functional changes by recording them as site-specific debits and credits as defined below.

> **a.) Credit:** A unit of measure, e.g., a functional capacity unit in the Hydrogeomorphic Assessment Method, representing the gain of aquatic function at a compensatory mitigation site; the measure of function is typically indexed to the number of acres of resource restored, established, enhanced, or protected as compensatory mitigation.
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> **b.) Debit:** A unit of measure, e.g., a functional capacity unit in the Hydrogeomorphic Assessment Method, representing the loss of aquatic function at a project site; the measure of function is typically indexed to the number of acres impacted by issuance of the permit.

4. **Acreage Surrogate:** In the absence of more definitive information on the functions of a specific wetland site, a minimum one-to-one acreage replacement may be used as a reasonable surrogate for no net loss of functions. For example, information on functions might be lacking for enforcement actions that generate after-the-fact permits or when there is no appropriate method to evaluate functions. When Districts require one-to-one acreage replacement, they will inform applicants of specific amounts and types of required mitigation. Districts will provide rationales for acreage replacement and identify the factors considered when the required mitigation differs from the one-to-one acreage surrogate.

5. **Streams**. Districts should require compensatory mitigation projects for streams to replace stream functions where sufficient functional assessment is feasible. However, where functional assessment is not practical, mitigation projects for streams should generally replace linear feet of stream on a one-to-one basis. Districts will evaluate such surrogate proposals carefully because experience has shown that stream compensation measures are not always practicable, constructible, or ecologically desirable.

e. Wetland Project Types: Although the following definitions were developed to characterize wetland projects, the principles they reflect may also be useful for decisions on other aquatic resource projects.

1. **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.

2. **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:

> **a.) 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.
>
> **b.) 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 <u>not</u> result in a gain in wetland acres.

3. **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 directed alteration.

4. **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 only in exceptional circumstances.

f. Preservation Credit: Districts may give compensatory mitigation credit when existing wetlands, or other aquatic resources are preserved in conjunction with establishment, restoration, and enhancement activities. However, Districts should only consider credit when the preserved resources will augment the functions of newly established, restored, or enhanced aquatic resources. Such augmentation may be reflected in the amount of credit attributed to the entire mitigation project. In exceptional circumstances, the preservation of existing wetlands or other aquatic resources may be authorized as the sole basis for generating credits as mitigation projects. Natural wetlands provide numerous ecological benefits that restored wetlands cannot provide immediately and may provide more practicable long-term ecological benefits. If preservation alone is proposed as mitigation, Districts will consider whether the wetlands or other aquatic resources: 1) perform

important physical, chemical or biological functions, the protection and maintenance of which is important to the region where those aquatic resources are located; and, 2) are under demonstrable threat of loss or substantial degradation from human activities that might not otherwise be avoided. The existence of a demonstrable threat will be based on clear evidence of destructive land use changes that are consistent with local and regional (i.e., watershed) land use trends, and that are not the consequence of actions under the permit applicant's control.

g. On-site and Off-site Mitigation: Districts may require on-site, off-site, or a combination of on-site and off-site mitigation to maintain wetland functional levels within watersheds. Mitigation should be required, when practicable, in areas adjacent or contiguous to the discharge site (on-site compensatory mitigation). On-site mitigation generally compensates for locally important functions, e.g., local flood control functions or unusual 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, e.g., is of greater ecological importance to the region of impact. Off-site mitigation will be in the same geographic area, i.e., in close proximity to the authorized impacts and, to the extent practicable, in the same watershed. In choosing between on-site or off-site compensatory mitigation, Districts will consider: 1) likelihood for success; 2) ecological sustainability; 3) practicability of long-term monitoring and maintenance or operation and maintenance; and, 4) relative costs of mitigation alternatives.

h. In-kind and Out-of-kind Mitigation: Districts may require in-kind, out-of-kind, or a combination of in-kind and out-of-kind, compensatory mitigation to achieve functional replacement within surrounding watersheds. In-kind compensation for a wetland loss involves replacement of a wetland area by establishing, restoring, enhancing, or protecting and maintaining a wetland area of the same physical and functional type. In-kind replacement generally is required when the impacted resource is locally important. Out-of-kind compensation for a wetland loss involves replacement of a wetland area by establishing, restoring, enhancing, or protecting and maintaining an aquatic resource of different physical and functional type. Out-of-kind mitigation is appropriate when it is practicable and provides more environmental or watershed benefit than in-kind compensation (e.g., of greater ecological importance to the region of impact).

i. Buffers: Districts may require that compensatory mitigation for projects in wetlands or other aquatic resources include the establishment and maintenance of buffers to ensure that the overall mitigation project performs as expected. Buffers are upland or riparian areas that separate wetlands or other aquatic resources from developed areas and agricultural lands. Buffers typically consist of native plant communities (i.e., indigenous species) that reflect the local landscape and ecology. 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. Additional guidance regarding the appropriate use of buffers as a component of compensatory mitigation is forthcoming.

1. **Upland Areas:** Under limited circumstances, Districts may give credit for inclusion of upland areas within a compensatory mitigation project to the degree that the protection and management of such areas is an enhancement of aquatic functions and increases the overall ecological functioning

of the mitigation site, or of other aquatic resources within the watershed (see Federal Mitigation Banking Guidance and Nationwide Permit General Condition 19). Such enhancement may be reflected in the amount of credit attributed to the mitigation project. Districts will evaluate and document the manner and extent to which upland areas augment the functions of wetland or other aquatic resources. The establishment of buffers in upland areas may only be authorized as mitigation if the District determines that this is best for the aquatic environment on a watershed basis. In making this determination, Districts will consider whether the wetlands or other aquatic resources being buffered: 1) perform important physical, chemical, or biological functions, the protection and maintenance of which is important to the region where those aquatic resources are located; and 2) are under demonstrable threat of loss or substantial degradation from human activities that might not otherwise be avoided.

2. **Riparian Areas:** Districts may give credit for inclusion of riparian areas within a compensatory mitigation project to the degree that the protection and management of such areas is an enhancement of aquatic functions and increases the overall ecological functioning of the mitigation site, or of other aquatic resources within the watershed. Such enhancement may be reflected in the amount of credit attributed to the mitigation project. Districts will evaluate and document the manner and extent to which riparian areas augment the functions of streams or other aquatic resources. The establishment of buffers in riparian areas may only be authorized as mitigation if the District determines that this is best for the aquatic environment on a watershed basis. In making this determination, Districts will consider whether the streams or other aquatic resources being buffered: 1) perform important physical, chemical, or biological functions, the protection and maintenance of which is important to the region where those aquatic resources are located; and 2) are under demonstrable threat of loss or substantial degradation from human activities that might not otherwise be avoided.

j. Compensatory Mitigation Alternatives: Permit applicants may propose the use of mitigation banks, in-lieu fee arrangements, or separate activity-specific projects.

k. Public Review and Comment:

1. **Individual Permits**: Proposed compensatory mitigation will be made available for public review and comment, consistent with the form (mitigation bank, in-lieu fee arrangement, or separate activity-specific compensatory mitigation project) of proposed compensation. Although, as a matter of regulation at 33 CFR 325.1 (d)(9), compensatory mitigation plans are not required before the Corps can issue a public notice, Districts should encourage applicants, during pre-application consultation, to provide mitigation plans with applications to facilitate timely and effective review. Public Notices should indicate the form of proposed compensatory mitigation and include information on components of the compensatory mitigation plan. If mitigation plans are available, synopses may be included in Public Notices and the complete plans made available for inspection at District offices. If mitigation plans are available and reproducible, Districts will forward copies to Federal, tribal, and state resource agencies. Districts should not delay issuing Public Notices when mitigation plans are not submitted with otherwise complete applications proposing impacts to aquatic resources.

2. **General Permits**: Requests for nationwide and regional general permit verifications are not subject to public notice and comment. However, general permit compensatory mitigation provisions or requirements are published for public comment at the time general permits are proposed for issuance or reissuance. Additional review of case-specific mitigation plans should be consistent with the conditions of the Nationwide or Regional Permit. Public review and comment should be provided for proposed mitigation banks and in-lieu-fee arrangements consistent with the Banking Guidance and In-lieu-fee Guidance provisions.

l. Permit Special Conditions: Districts will include in individual permits, and general permit verifications that contain a wetland compensatory mitigation requirement, special conditions that identify: 1) the party(s) responsible for meeting any or all components of compensatory mitigation requirements; 2) performance standards for determining compliance; and, 3) other requirements such as financial assurances, real estate assurances, monitoring programs, and the provisions for short and long-term maintenance of the mitigation site. Special conditions may include, by reference, the compensatory mitigation plan, monitoring requirements and a contingency mitigation plan. Permittees are responsible for assuring that activity-specific compensatory mitigation projects are implemented successfully and protected over the long-term. 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 arrangement become liable for implementation and performance.

m. Timing of Mitigation Construction: Construction should be concurrent with authorized impacts to the extent practicable. Advance or concurrent mitigation can reduce temporal losses of aquatic functions and facilitate compliance. In some circumstances it may be acceptable to allow impacts to aquatic resources to occur before accomplishing compensatory mitigation, for example, in cases where construction of the authorized activity would disturb or harm on site compensatory mitigation work or where a simple restoration project is required. Some Federal-aid highway projects have legal and contractual requirements regarding the timing of mitigation that conflict with the policy to accomplish advance or concurrent mitigation. For compensatory mitigation involving in-lieu-fee arrangements or mitigation banks, the guidance applicable to those forms of mitigation should be followed with respect to timing of mitigation site development. After-the-fact mitigation may also be required for permits issued in emergencies or from an enforcement action.

n. Compensatory Mitigation Accomplished After Overall Project Construction: In general, when impacts to aquatic resources are authorized before mitigation is initiated, Districts will require: 1) a Corps-approved mitigation plan; 2) a secured mitigation project site; 3) appropriate financial assurances in place; and, 4) legally protected, adequate water rights where necessary. Initial physical and biological improvements in the mitigation plan generally should be completed no later than the first full growing season following the impacts from authorized activities. If beginning the initial improvements within that time frame is not practicable, then other measures that mitigate for the consequences of temporal losses should be included in the mitigation plan.

o. General Permits: For activities authorized by general permits, Districts may recommend consolidated compensatory mitigation projects such as mitigation banks and in-lieu fee programs where such sources of compensatory mitigation are available. Consolidated mitigation facilitates a watershed approach to mitigating impacts to waters of the United States. For regional general permits associated with Special Area Management Plans or other types of watershed plans, the District may also recommend the use of mitigation banks or in-lieu-fee arrangements, consistent with the guidance for those forms of compensation.

3. <u>Compensatory Mitigation Plans:</u> Districts will strive to discuss compensatory mitigation proposals with applicants during pre-application consultation. If this does not occur, the scope and specificity of proposed compensatory mitigation plans merely represent the applicant's view of what is necessary, a view that may not be acceptable to the Corps or other governmental authorities. At the earliest opportunity, Districts will advise applicants of the mitigation sequencing requirements of the Section 404(b)(1) Guidelines, or what is required for general permits. Compensation is the last step in the sequencing requirements of the Section 404 (b)(1) Guidelines. Thus, for standard permit applications, Districts should not require detailed compensatory mitigation plans until they have established the unavoidable impact. In all circumstances, the level of information provided regarding mitigation should be commensurate with the potential impact to aquatic resources, consistent with the guidance from Regulatory Guidance Letter 93-2 on the appropriate level of analysis for compliance with the Section 404 (b)(1) Guidelines. Districts will identify for applicants the pertinent factors for this determination (e.g., watershed considerations, local or state requirements, uncertainty, out-of-kind compensation, protection and maintenance requirements, etc.). Districts also will identify for applicants the rationale to be used (e.g., best professional judgment, Hydrogeomorphic Assessment Method, Wetland Rapid Assessment Procedure, etc.) for determining allowable impact and required compensatory mitigation. Applicants will be encouraged to submit appropriate compensatory mitigation proposals with individual permit applications or general permit pre-construction notices. The components listed below form the basis for development of compensatory mitigation plans.

a. Baseline Information: As part of the permit decision Districts will include approved, written compensatory mitigation plans describing the location, size, type, functions and amount of impact to aquatic and other resources, as well as the resources in the mitigation project. In addition, they should describe the size, e.g., acreage of wetlands, length and width of streams, elevations of existing ground at the mitigation site, historic and existing hydrology, stream substrate and soil conditions, and timing of the mitigation. Baseline information may include quantitative sampling data on the physical, chemical, and biological characteristics of the aquatic resources at both the proposed mitigation site and the impact site. This documentation will support the compensatory mitigation requirement.

b. Goals and Objectives: Compensatory mitigation plans should discuss environmental goals and objectives, the aquatic resource type(s), e.g., hydrogeomorphic (HGM) regional wetland subclass, Rosgen stream type, Cowardin classification, 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). For example, for impacts to tidal fringe wetlands the mitigation goal may be to replace lost finfish and shellfish habitat, lost estuarine habitat, or lost water quality functions associated with tidal backwater flooding. The objective statement should describe 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.

c. Site Selection: Compensatory mitigation plans should describe the factors considered during the site selection process and plan formulation including, but not limited to:

1. **Watershed Considerations:** Mitigation plans should describe how the site chosen for a mitigation project contributes to the specific aquatic resource needs of the impacted watershed. A compensatory mitigation project generally should be in the same watershed. The further removed geographically that the mitigation is, the greater is the need to demonstrate that the proposed mitigation will reasonably offset authorized impacts.

2. **Practicability:** The mitigation plan should describe site selection in terms of cost, existing technology, and logistics.

3. **Air Traffic:** Compensatory mitigation projects that have the potential to attract waterfowl and other bird species that might pose a threat to aircraft will be sited consistent with the Federal Aviation Administration Advisory Circular on Hazardous Wildlife Attractants on or near Airports (AC No: 150/5200-33, 5/1/97).

d. Mitigation Work Plan: Compensatory mitigation work plans should contain written specifications and work descriptions, including, but not limited to: 1) boundaries of proposed restoration, establishment, enhancement, or preserved areas (e.g., maps and drawings); 2) construction methods, timing and sequence; 3) source of water supply and connections to existing waters and proximity to uplands; 4) native vegetation proposed for planting; 5) allowances for natural regeneration from an existing seed bank or planting; 6) plans for control of exotic invasive vegetation; 7) elevation(s) and slope(s) of the proposed mitigation area to ensure they conform with required elevation and hydrologic requirements, if practicable, for target plant species; 8) erosion control measures; 9) stream or other open water geomorphology and features such as riffles and pools, bends, deflectors, etc.; and 10) a plan outlining site management and maintenance.

e. Performance Standards: Compensatory mitigation plans will contain written performance standards for assessing whether mitigation is achieving planned goals. Performance standards will become part of individual permits as special conditions and be used for performance monitoring. Project performance evaluations will be performed by the Corps, as specified in the permits or special conditions, based upon monitoring reports. Adaptive management activities may be required to adjust to unforeseen or changing circumstances, and responsible parties may be required to adjust mitigation projects or rectify deficiencies. The project performance evaluations will be used to determine whether the environmental benefits or "credit(s)" for the entire project equal or exceed the environmental impact(s) or "debit(s)" of authorized activities. Performance standards for compensatory mitigation sites will be based on quantitative or qualitative

characteristics that can be practicably measured. The performance standards will be indicators that demonstrate that the mitigation is developing or has developed into the desired habitat. Performance standards will vary by geographic region and aquatic habitat type, and may be developed through interagency coordination at the regional level. Performance standards for wetlands can be derived from the criteria in the 1987 Corps of Engineers Wetlands Delineation Manual, such as the duration of soil saturation required to meet the wetland hydrology criterion, or variables and associated functional capacity indices in hydrogeomorphic assessment method regional guidebooks. Performance standards may also be based on reference wetlands.

f. Project Success: Compensatory mitigation plans will identify all parties responsible for compliance with the mitigation plan and their role in the mitigation project. The special conditions for the permit will identify these responsibilities as required above. Restoration projects provide the greatest potential for success in terms of functional compensation; however, each type has utility and may be used for compensatory mitigation.

g. Site Protection: Compensatory mitigation plans should include a written description of the legal means for protecting mitigation area(s), and permits will be conditioned accordingly. The wetlands, uplands, riparian areas, or other aquatic resources in a mitigation project should be permanently protected, in most cases, with appropriate real estate instruments, e.g., conservation easements, deed restrictions, transfer of title to Federal or state resource agencies or non-profit conservation organizations. Generally, conservation easements held by tribal, state or local governments, other Federal agencies, or non-governmental groups, such as land trusts, are preferable to deed restrictions. Homeowners' associations should be used for these purposes only in exceptional circumstances, such as when the association is responsible for community open spaces with restrictive covenants. Districts may require third party monitoring if necessary to ensure permanent protection. In no case will the real estate instrument require a Corps official's signature. Also, Districts will not approve a requirement that results in the Federal government holding deed restrictions on properties, or that contains real estate provisions committing Corps Districts to any interest in the property in question, unless proper statutory authority is identified that authorizes such an arrangement.

h. Contingency Plan: Compensatory mitigation plans should include contingency plans for unanticipated site conditions or changes. For example, contingency plans may identify financial assurance mechanisms that could be used to implement remedial measures to correct unexpected problems. Additionally, contingency plans will allow for modifications to performance standards if mitigation projects are meeting compensatory mitigation goals, but in unanticipated ways. Finally, contingency plans could address the circumstances that might result in no enforcement or remedial action if forces beyond the control of responsible parties adversely impact mitigation sites. In any case, Districts will determine the course of action to be taken in the event of unexpected conditions based on the goals and objectives for the mitigation project, the performance standards, and the provisions of the contingency plan.

i. Monitoring and Long-term Management: Compensatory mitigation plans will identify the party(s) 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 of time, 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. Districts may take enforcement action even after the identified monitoring period, if there has been a violation.

j. Financial Assurances: Compensatory mitigation plans will identify the party responsible for providing and managing any financial assurances and contingency funds set aside for remedial measures to ensure mitigation success. This includes identifying the party that will provide for long-term management and protection of the mitigation project. Financial assurances should be commensurate with the level of impact and the level of compensatory mitigation required. Permit conditions for minimal and low impact projects are generally sufficient for enforcing performance standards and requiring compliance, without the requirement of additional financial assurances. Financial assurances should be sufficient to cover contingency actions such as a default by the responsible party, or a failure to meet performance standards. District Engineers will generally emphasize financial assurances when the authorized impacts occur prior to successful completion of the mitigation, to include the monitoring period. Financial assurances may be in the form of performance bonds, irrevocable trusts, escrow accounts, casualty insurance, letters of credit, legislatively enacted dedicated funds for government operated banks or other approved instruments. Such assurances may be phased-out or reduced, once the project has been demonstrated functionally mature and self-sustaining in accordance with performance standards.

Financial assurances for third party mitigation should be consistent with existing guidance (e.g., Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, and 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). The District will determine project success, and the need to use financial assurances to carry out remedial measures, in accordance with the project performance standards.

4. **Duration**. This guidance remains effective unless revised or rescinded.

FOR THE COMMANDER:

For Michael J. Walsh US Army Col.

Encl

ROBERT H. GRIFFIN
Major General, U.S. Army
Director of Civil Works

Appendix A: Authorities

This RGL is issued in accordance with the following statutes, regulations, and policies. It is intended to clarify provisions within these existing authorities and does not establish new requirements.

a. Clean Water Act Section 404 [33 USC 1344].

b. Rivers and Harbors Act of 1899 Section 10 [33 USC 403 et seq.].

c. Environmental Protection Agency, Section 404(b)(1) Guidelines [40 CFR Part 230]. Guidelines for Specification of Disposal Sites for Dredged or Fill Material.

d. Department of the Army, Section 404 Permit Regulations [33 CFR Parts 320-331]. Policies for evaluating permit applications to discharge dredged or fill material.

e. 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 [February 6, 1990].

f. Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks [November 28, 1995].

g. 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 [November 7, 2000]

h. Title XII of the Food Security Act of 1985 as amended by the Farm Security and Rural Investment Act of 2002 [16 USC 3801 et seq.].

i. National Environmental Policy Act [42 USC 4321 et seq.], including the Council on Environmental Quality's implementing regulations [40 CFR Parts 1500-1508].

j. Fish and Wildlife Coordination Act [16 USC 661 et seq.].

k. Fish and Wildlife Service Mitigation Policy [46 FR pages 7644-7663, 1981].

l. Magnuson Fishery Conservation and Management Act [16 USC 1801 et seq.].

m. National Marine Fisheries Service Habitat Conservation Policy [48 FR pages 53142-53147, 1983].

n. The Transportation Equity Act for the 21st Century (TEA-21)

o. Federal Aviation Administration Advisory Circular on Hazardous Wildlife Attracts on or near Airports (AC No: 150/5200-33, 5/1/97)

p. Endangered Species Act of 1973, as amended [16 U.S.C. 1531 et seq.]

q. Migratory Bird Treaty Act [16 U.S.C. 703 et seq.]

r. Issuance of Nationwide Permits [67 FR 2020-2095, January 15, 2002]

Appendix B

Taken from ***Operational Guidelines for Creating or Restoring Self-Sustaining Wetlands*, National Research Council 'Compensating for Wetland Losses Under The Clean Water Act,' June 2001** (Chapter 7, pp. 123-128).

1. 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).

Regulatory agency personnel should 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 are expected natural disturbances and should be accommodated in mitigation designs rather than feared. 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.

2. 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.

3. *Restore or develop naturally variable hydrological conditions.* 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 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.

4. *Whenever possible, choose wetland restoration over creation.* 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 creation 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). The Florida Department of Environmental Regulation (FDER 1991a) recommends an emphasis on restoration first, then enhancement, and, finally, creation as a last resort. Morgan and Roberts (1999) recommend encouraging the use of more restoration and less creation.

5. *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 large woody debris. Be aware that more specific habitat designs and planting will be required where rare and endangered species are among the specific restoration targets.

Whenever feasible, use natural recruitment sources for more resilient vegetation establishment. Some systems, especially estuarine wetlands, are rapidly colonized, and natural recruitment is often equivalent or superior to plantings (Dawe et al. 2000). Try to take advantage of native seed banks, and use soil and plant material salvage whenever possible. Consider planting mature plants as supplemental rather than required, with the decision depending on early results from natural recruitment and invasive species occurrence. Evaluate on-site and nearby seed banks to ascertain their viability and response to hydrological conditions. When plant introduction is necessary to promote soil stability and prevent invasive species, the vegetation selected must be appropriate to the site rather than forced to fit external pressures for an ancillary purpose (e.g., preferred wildlife food source or habitat).

6. *Pay particular attention to appropriate planting elevation, depth, soil type, and seasonal timing.* When the introduction of species is necessary, select appropriate genotypes. Genetic differences within species can affect wetland restoration outcomes, as found by Seliskar (1995), who planted cordgrass (*Spartina alterniflora*) from Georgia, Delaware, and Massachusetts into a tidal wetland restoration site in Delaware. Different genotypes displayed differences in stem density, stem height, below-ground biomass, rooting depth, decomposition rate, and carbohydrate allocation. Beneath the plantings, there were differences in edaphic chlorophyll and invertebrates.

Many sites are deemed compliant once the vegetation community becomes established. If a site is still being irrigated or recently stopped being irrigated, the vegetation might not survive. In other cases, plants that are dependent on surface-water input might not have developed deep root systems. When the surface-water input is stopped, the plants decline and eventually die, leaving the mitigation site in poor condition after the Corps has certified the project as compliant.

7. *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 creation 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. In the case of some less-studied, restored wetland types, there is little scientific or technical information on natural microtopography (e.g., what causes strings and flarks in patterned fens or how hummocks in fens control local nutrient dynamics and species assemblages and subsurface hydrology are poorly known). In all cases, but especially those with minimal scientific and technical background, the proposed development wetland or appropriate example(s) of the target wetland type should provide a model template for incorporating microtopography.

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.

8. *Pay attention to subsurface conditions, including soil and sediment geochemistry and physics, groundwater quantity and quality, and infaunal communities.* 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. Even if the 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 included chemical attributes that control critical geochemical or biological processes, such as pH, redox, nutrients (nitrogen and phosphorus species), organic content and suspended matter.

9. Consider complications associated with creation 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 extensive invasion by exotic 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 below-ground processes and facilitate exotic species colonization (Zedler 1996).

10. Conduct early monitoring 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. The monitoring of wetland structure, processes, and function from the onset of wetland restoration or creation can indicate potential problems. Process monitoring (e.g., water-level fluctuations, sediment accretion and erosion, plant flowering, and bird nesting) is particularly important because it will likely identify the source of a problem and how it can be remedied. Monitoring and control of nonindigenous species should be a part of any effective adaptive management program. Assessment of wetland performance must be integrated with adaptive management. Both require understanding the processes that drive the structure and characteristics of a developing wetland. Simply documenting the structure (vegetation, sediments, fauna, and nutrients) will not provide the knowledge and guidance required to make adaptive "corrections" when adverse conditions are discovered. Although wetland development may take years to decades, process-based monitoring might provide more sensitive early indicators of whether a mitigation site is proceeding along an appropriate trajectory.