

ROCK ISLAND DISTRICT

MITIGATION AND MONITORING GUIDELINES

These guidelines address the Rock Island District's current interpretation and application of the National Wetlands Mitigation Action Plan, which includes recommendations from the National Academy of Sciences to compensate for aquatic resource impacts authorized under the Clean Water Act Section 404 and the Rivers and Harbors Act Section 10 programs. These guidelines are intended to summarize major points regarding the compensatory mitigation that may be required in a Department of the Army (DA) permit after all practicable steps have been taken to avoid and minimize impacts to aquatic sites. If additional details are required, users should refer to the *MultiAgency Compensatory Mitigation Plan Checklist*, the *Supplement: Compensatory Mitigation Plan Checklist*, and the paper titled *Incorporating the National Research Council's Mitigation Guidelines Into the Clean Water Act Section 404 Program*. These guidelines will be periodically reviewed for possible updating.

Deleted: g

Typically, mitigation is project-specific and located at or adjacent to the project site where the aquatic resource functions are being lost. These guidelines relate only to that project-specific mitigation.

Another method of mitigating for impacts to aquatic resources is the use of mitigation banks. These guidelines do not include information on mitigation banks. Federal guidance for the establishment, use and operation of mitigation banks can be found in the Federal Register dated November 28, 1995 (Volume 60, Number 228, Page 58605).

Deleted: ¶

Mitigation Goals and Objectives.

Replace all the functions of the wetland or other water of the United States that will be lost if the project is constructed. Generally, the wetlands and other waters of the United States will be replaced in-kind and within the same watershed and will be monitored to confirm success.

Baseline Information for Impact and Proposed Mitigation Sites.

The applicant is responsible for providing the Rock Island District a Mitigation Plan with current baseline information on both the project site(s) and the proposed mitigation site(s). The baseline information must include location maps, topographical maps, delineations and maps of all existing waters of the United States, information on soils, vegetation, and hydrology (including a description of all water sources, frequency, duration, and depth of inundations,

Deleted: /permittee

Deleted: The baseline information must include a description of the sites, as they currently exist.

Deleted: descriptions

and frequency, depth, and duration of soil saturation), the site's geomorphic setting (land form, geologic evolution, and topographic position on the landscape), a brief water quality assessment of any water body associated with the site, ownership, and recent, existing, and adjacent land uses. The applicant must also describe the acreage, types (according to the U.S. Department of the Interior, Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States*), and general functions of wetlands and/or other waters of the United States that will be lost at the impact site and gained at the mitigation site. Any overall watershed improvements should also be described. Finally, the sources of the baseline information must be identified. If a person is used as a source of information, the qualifications and experience of that person should be described.

- Deleted: ,
- Deleted: and
- Deleted: historic
- Deleted: and
- Deleted: /permittee
- Deleted: functions,
- Deleted: and
- Formatted
- Deleted: , those that will be
- Deleted: ,
- Deleted: and a
- Deleted: to be gained

Mitigation Site Selection and Justification.

Good site selection will reduce risks and construction costs. As part of the Mitigation Plan, an applicant must submit a description of the site selection process, the likelihood of success, and future land use compatibility. The following points should also be considered when selecting a mitigation site and must be discussed in the Mitigation Plan to justify the location of a site.

- Deleted: Site
- Deleted: is essential for successful mitigation.
- Deleted: The
- Deleted: /permittee

1. The mitigation site should, generally, be in the same watershed as the area that will be impacted by the project. For purposes of these guidelines, watershed is defined as an 8-digit Hydrologic Unit Code (HUC) area. If the Rock Island District determines that mitigation within the same HUC-8 watershed is not practicable, or that mitigation outside the watershed would be environmentally advantageous, it may be proposed in an adjoining HUC-8 watershed within in the same 6-digit HUC area. Mitigation proposed outside the HUC-8 watershed will require additional information to demonstrate that the mitigation will reasonably offset proposed project impacts and will not result in adverse cumulative impacts to the watershed. Mitigation proposed outside the HUC-8 watershed may also require a higher mitigation to impact ratio.

- Formatted
- Formatted
- Formatted
- Formatted
- Formatted
- Deleted: and
- Formatted
- Formatted
- Formatted
- Formatted
- Deleted: mitigation

2. Aquatic resource restoration on areas that were previously aquatic is preferable to their creation on upland, or enhancement and/or preservation of an existing aquatic resource. Wetland restoration on farmland that the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) has identified as "prior converted" (PC) is relatively low-risk and inexpensive. Wetland Restoration on these lands may involve plugging or breaking drain tile, plugging ditches, cessation of farming activities, and planting wetland vegetation. High success rates for mitigation on these areas can be attributed to the presence of hydric soils and wetland seed banks, and the relative ease of restoring previous hydrologic conditions.

3. The mitigation should be in kind. That is, the type of wetland or other aquatic resource at the mitigation site should be the same as at the impact site.

4. Low areas near a water source are more easily converted to wetlands than are high areas. The water source can be either groundwater or surface water. Wetland creation through excavation should be avoided in areas lacking data on groundwater elevations.

Deleted: 3

5. Avoid impacting existing aquatic areas and valuable upland habitat such as sedge meadows, sand dune areas, forested bottomland, prairie, and mature forests.

Deleted: 4

6. Locate mitigation sites as close as possible to existing natural areas.

Deleted: 5

7. Mitigation sites should be sustainable and require little maintenance.

Deleted: as far as possible from human disturbances and

Deleted: 6

8. Avoid areas where the mitigation may adversely impact historic sites or threatened or endangered species. The applicant must ensure that compliance is achieved with the National Historic Preservation Act, the Endangered Species Act, and all State regulations.

Deleted: self-maintaining.

Deleted: 7

9. Areas with non-native plants as dominants should be avoided when possible.

10. Site selection assistance can be obtained from the NRCS, the appropriate State Department of Natural Resources, and/or private consultants.

Deleted: 8

Deleted: the U.S. Fish and wildlife Service, the U.S. Environmental Protection Agency, the Iowa

Mitigation Work Plan.

A Mitigation Plan must include a good work plan to help ensure the success of wetland mitigation. It should consider and address all aspects of creating successful mitigation. Including the plan in the application for a DA permit may reduce the time required to process the application. Pre-application coordination with the Corps and applicable resource agencies is highly recommended.

Deleted: A

Deleted: mitigation

Deleted: is necessary

Deleted: i

Deleted: The plan doesn't have to be lengthy, but needs to be thorough and complete.

Deleted: Department of the Army

Mitigation plans should include baseline information, a location map, site selection justification, proposed mitigation to impact ratios (in acres for each wetland type and in linear feet for streams), pre and post-construction water budgets (including flood frequencies and durations), an aerial photograph of the mitigation site, plan view drawings showing such things as proposed channels, wetlands and buffers, existing wetlands and other waters of the United States, site boundaries, areas to be planted, existing and proposed structures, a planting plan, a construction schedule, before and after cross-sectional drawings of areas to be filled and/or excavated, construction methods, details of water control structures and tile outlets, seed source for any areas expected to revegetate naturally, performance standards, erosion control measures, plans for site

Deleted: a location map,

Deleted: areas

Deleted: and

protection and maintenance, a monitoring plan, the name and qualifications of the person who will monitor the site, adaptive management plans, and financial assurances. A checklist of all the information that may be required in a Mitigation Plan can be found on page 10. The applicant is responsible for formulating the mitigation plan.

Deleted: adaptive management plans,

Deleted: plans for site protection and maintenance, monitoring plans

Deleted: /permittee

Applicants should also consider the following when developing a Mitigation Plan:

Deleted: The mitigation plan

1. Attempt to create persistent, self-maintaining areas that mimic natural aquatic sites. Seek out passive management techniques rather than active management techniques.

2. Using vegetation, elevations, water depths, wildlife habitat, etc., strive for diversity to include a mix of habitats such as open water, various wetland types, and adjacent upland buffers to provide a greater variety of functions.

Deleted: Strive

Deleted: in all areas

Deleted: (vegetation, elevations, water depths, wildlife habitat, etc.)

3. Use watershed and ecosystem approaches to determine compensatory mitigation requirements. Consider the needs of the impacted watershed. Mitigation plans must describe the overall watershed improvements to be gained.

Deleted: , as well as the resource needs of neighboring watersheds

4. The mitigation should be designed to replace aquatic areas with at least the same quality and quantity as those that will be impacted by the project. Mitigation plans that maximize the quality and quantity of aquatic habitat will have a better chance of succeeding and will help offset the lag time between the adverse impacts and the full development of the mitigation sites.

Deleted: create

Deleted: of

5. Choose contractors and consultants who are familiar with the Section 404 permit program and who have previously had success at providing mitigation.

Deleted: creating

6. Complete the mitigation site construction prior to or concurrent with impacting the aquatic resource at the project site. Completing the mitigation beforehand will reduce lag time and will ensure that the adverse impacts are compensated even if construction of the project is interrupted. In some instances (such as after-the-fact authorizations and when the mitigation can not be completed prior to or concurrent with the project impacts), higher than normal mitigation:impact ratios will be necessary.

Deleted: water of the United States

Deleted: This

Deleted: insure

Deleted: for

7. Plan upland and transitional buffer areas at the mitigation site. Buffer areas shield wetland and other waters of the United States from nearby activities, provide additional habitat, and filter runoff.

Deleted: the

8. To ensure long-term stability and success, restrict access to the mitigation area to keep out livestock, off-road vehicles, farming equipment, etc., but allow wildlife and compatible, low impact activities (e.g., some forms of recreation).

Deleted: R

Deleted: of

9. Design the mitigation site to require as few structures as possible. Structures, at some point in time, will require maintenance and may fail. Generally, permit conditions require the repair or replacement of structures that fail.

10. Avoid proposing wetland mitigation at a site that is designed (primarily) as a storm water retention area. Storm water retention areas usually have larger fluctuations of water levels and silt and scour areas than natural areas. These features increase erosion and adversely impact vegetation. Storm water runoff should also be avoided as a primary water source in mitigation wetlands for the same reasons. Storm water runoff may also contain salts, oils, and pesticides.

Deleted: designing a

Deleted: with

Deleted: /or high

Deleted: .

Deleted:

Deleted: collection

11. In areas with high sedimentation rates, sedimentation basins should be constructed above mitigation areas.

12. Plan to minimize soil compaction at wetland mitigation sites by the use of low-ground-pressure, tracked vehicles and by limiting the number of trips that equipment makes over the area. Compacted areas may require deep-tilling or ripping to loosen the soil.

Deleted: 11

Deleted: must be

Deleted: tilled

Deleted: ripped

Deleted: 12

13. Plan to complete construction at mitigation sites during dry times of the year. This will reduce erosion and compaction and will make it easier to complete the work.

14. In areas where wetlands are being created through excavation, plan to strip and stockpile topsoils for use after construction to line created wetland areas. The topsoil lining should generally be from 12 to 18 inches thick. This will necessitate excavating mitigation areas 12 to 18 inches deeper than their final design grade. The topsoil should be handled as little as possible and re-spread as soon as possible. An exception to this recommendation may be when the topsoil contains many invasive plants.

Deleted: 13

15. Final slopes in mitigation wetlands should be gradual (10:1 to 100:1). Stream bank slopes for purposes of mitigation should be no steeper than 3:1.

Deleted: 14

Deleted: 100

16. The edges of created wetlands should be scalloped to provide longer shorelines and greater "edge habitat".

Deleted: 15

Deleted: Scalloping will provide a more natural appearance.

17. Bottom elevations in created wetlands should vary to provide more diversity and to help insure wet conditions in at least some areas during dry periods.

Deleted: 16

18. During construction, care should be taken to control erosion. This may require the use of silt fences, temporary cover crops, temporary sedimentation basins, etc.

Deleted: 17

19. Contractors should (at a minimum) be supervised during final grading and spreading of topsoil.

Deleted: 18

20. Planting of vegetation should be completed as soon after construction as possible. However, it may be prudent to vegetate areas of unknown future hydrology with an annual cover crop and to plant the planned permanent vegetation the following spring or fall after the hydrologic zones are determined. Sloped areas should be appropriately vegetated prior to inundation.

Deleted: 19

21. Applicants must attempt to control invasive species such as Reed Canarygrass, Common Reed, Autumn Olive, Buckthorn, Multiflora Rose, and Purple Loosestrife at a mitigation site using currently accepted methodologies.

Deleted: 20

Deleted: Non-native plants should be avoided and i

Deleted: should be controlled.

22. The planting of transplants or nursery stock from nearby areas is usually the most successful method of vegetating a site in wetland species since those plants are acclimated to local conditions.

Deleted: 21

Deleted: When planting is necessary

Deleted: ,

23. Plant stock should be planted quickly and not allowed to dry out.

Deleted: it is

Deleted: 22

24. Plantings require weed control with mulching, mowing, or approved herbicides and may require watering until the plantings are established.

Deleted: 23

25. When aquatic functions will be lost due to a project, the mitigation plan should replace those functions on at least a 1:1 (mitigation:impact) basis. Aquatic functions may be "lost" when they are filled, drained, excavated, diverted, or inundated. Until approved functional assessments are developed, applicants should strive to restore or create lost aquatic resources on at least an acre-for-acre basis for wetlands and, when practicable, on a linear-foot for linear-foot basis for streams. When the Corps determines that linear foot -for-linear foot stream mitigation is not practicable, or that other options would be more environmentally advantageous, other acceptable stream ecosystem improvement measures (such as grade stabilization structures, riffle structures and other habitat improvements, channel restoration, impoundment removal, planting and maintenance of vegetative buffers, improvements to bank slopes, tree plantings, fencing, and erosion control measures) will be required. Anything less than acre-for acre wetland mitigation or linear foot-for-linear foot stream mitigation will require written justification and additional mitigation measures. The use of enhancement or preservation of an existing aquatic resource as mitigation should be used only in addition to restoration and/or creation on a 1:1 basis.

26. Higher mitigation:impact ratios are necessary for after-the-fact authorizations, when preservation of existing wetlands is a large part of the mitigation plan, for off-site mitigation, for out-of-kind mitigation, when the mitigation can not be completed prior to or concurrent with the project impacts, and when impacts will occur on higher quality aquatic sites (fens, sedge meadows, forested wetlands, potholes, areas designated as critical or rare habitat, etc.). The final determination as to how much mitigation will be required

will be made by the Rock Island District based on the above factors and on information gathered during the permit process.

27. Appropriate locations and methods of stream mitigation efforts must be determined on a site-specific basis. Projects involving stream channel losses should include a sufficient number or grade stabilization structures (usually at least one on the upstream end of the modified channel and one on the downstream end) to ensure stabilization of the new stream channel. Other mitigation measures may include those listed in paragraph 25, above. All structures should be designed and constructed to withstand the streams strongest flows and still be fish passable.

- Deleted: 25
- Deleted: P
- Deleted: the shortening of
- Deleted: streams
- Deleted: in-stream structures at least on the upstream and downstream ends of the disturbed channel.
- Deleted: The
- Deleted: with 4:1 upstream slopes
- Deleted: 20:1 downstream slopes, should be
- Deleted: of stone of a sufficient size
- Deleted: to withstand the streams strongest flows, and should be designed to
- Deleted: Riffle structures as habitat may also be warranted.
- Deleted: plans
- Deleted: whether
- Deleted: is achieving
- Deleted: criteria
- Deleted: While i
- Deleted: /permittee
- Deleted: , minimum performance standards are required
- Deleted: P
- Deleted: s
- Deleted: must include acreage thresholds and positive wetland indicators according to
- Deleted: .
- Deleted:

Performance Standards.

The Mitigation Plan must contain written performance standards for assessing mitigation success. Performance standards should be based on practicably measurable quantitative or qualitative characteristics of the mitigation plan. It is the applicant's responsibility to propose performance standards to be used to evaluate a mitigation site. The primary performance standard for a wetland mitigation site is the required acreage of jurisdictional wetland as determined by the 1987 Corps of Engineers Wetlands Delineation Manual ('87 Manual). Other performance standards may include such things as target (or optimal) depths, duration and/or frequency of inundation or saturation, erosion control, planting success, target (or optimal) degree of water-vegetation interspersion, plant species diversity, some measure of floristic quality, the presence of desired or required species, the absence of undesirable/alien/invasive species, vegetative percent cover, and vegetation structure. Performance standards for a stream mitigation site must include stable stream banks, bed, and structures and successfully vegetated banks and buffers. Other stream mitigation performance standards may include certain thresholds for channel condition, sediment deposition, riparian zone requirements, fish and wildlife habitat, insect/invertebrate habitat, unobstructed passage of aquatic life, channel sinuosity, and diversity. Established wetland and stream assessments can also be used to determine a mitigation site's success. Examples of wetland and stream assessments can be found on the Internet, at universities, and at various natural resource agencies.

Site Protection and Maintenance.

A plan for successful long-term management must be included in the Mitigation Plan. Successful long-term management should include deed restrictions, conservation easements, or title transfers. Deed restrictions and conservation easements should be recorded with the Recorder of Deeds in the county where the mitigation is located. Title Transfers should be to a willing government

- Deleted: Successful
- Deleted: can be insured with
- Deleted: with
- Deleted: insure long-term protection of a site by transferring the title of the property containing the mitigation

agency or non-profit conservation entity. Evidence of legal protective measures must be provided to the Rock Island District.

After construction, most mitigation sites require maintenance. A maintenance plan and schedule is required as part of the Mitigation Plan. Maintenance is the applicant's responsibility.

Deleted: the wetland will

Deleted:

Deleted: occasional

Deleted: /permittee

Monitoring Plan.

Applicants must inspect mitigation sites annually for at least five years. The Mitigation Plan must include a monitoring plan that includes the primary party responsible for monitoring, an on-site monitoring schedule, a description of what will be monitored, monitoring methods and tools, and the format for reporting monitoring data and assessing mitigation status. A person trained in the '87 Manual must perform the monitoring of wetland mitigation. Until a standard stream assessment method is approved, stream mitigation can be monitored by anyone able to fully evaluate the performance standards for a site. The results of the annual monitoring must be included in annual monitoring reports. At a minimum, the reports must describe whether or not the mitigation performance standards have been met or what progress is being made toward achieving such standards. Such things as planting success rates, on-site photos, estimation of vegetative covers, demonstration of hydrology, and planned or completed remedial work will also be required in the monitoring reports. Compensatory mitigation projects will be evaluated and monitored by the Corps to ensure compliance with all authorized DA permits.

Deleted: Mitigation

Deleted: must be inspected

Deleted: applicant/permittee

Deleted: submit

Deleted: 1987

Deleted: Corps of Engineers Wetlands Delineation

Deleted: may

Deleted: Compensatory mitigation projects will also be evaluated and monitored by the Corps

Adaptive Management Plan.

Corrective actions will be required if a mitigation site is not fully successful. An Adaptive Management Plan must be included in the Mitigation Plan. The Adaptive Management Plan must include the party responsible for adaptive management, a discussion of how potential challenges (e.g., insufficient wetland hydrology, a predominance of upland vegetation, flooding, drought, invasive species, seriously degraded site, over-browsing by deer, extensively developed landscape, etc.) will be handled, a discussion of potential remedial measures that can be quickly taken in the event mitigation does not meet performance standards in a timely manner, and a description of procedures to allow for modifications of performance standards if mitigation projects are meeting mitigation goals, but in unanticipated ways. Corrective actions should begin as soon as the failure to meet performance standards is recognized. Delaying necessary corrective actions will extend the monitoring period. The applicant is responsible for all required corrective actions, even if the mitigation site was transferred to a third party.

Deleted: may

Deleted: An ¶

Deleted: mitigation

Deleted: plan

Deleted: The ¶ applicant/permittee is responsible for all required corrective actions, even if the ¶ mitigation site was transferred to a third party.

Deleted: adaptive

Deleted: management

Deleted: plan

Financial Assurances.

Financial assurances may be required in the mitigation plan for non-government projects with large mitigation sites or when the likelihood of success at a mitigation site is in question. Financial assurances help ensure that the mitigation is successfully completed. Financial assurances can involve the use of performance bonds, letters of credit with a forfeiture clause, irrevocable trusts, escrow accounts, and casualty insurance. The financial assurances must be substantial enough to cover all costs of the mitigation, monitoring, site protection, and maintenance. When financial assurances are required, the applicant must identify the party(ies) responsible to establish and manage the financial assurance, the specific type of financial instrument, the method used to estimate the assurance amount, the date of establishment, the release and forfeiture conditions, and a schedule by which financial assurance will be reviewed and adjusted to reflect current economic factors.

Deleted: p

Deleted:

Deleted: ¶
w

Deleted: appears to be low

Deleted: will

Deleted: insure

Deleted: The ¶
f

Checklist of Information To Be Included In A Mitigation and Monitoring Plan

Note: While every item on this list will not be required for every project, incomplete information may slow the permit process. Pre-application consultations with Rock Island District regulatory personnel are recommended and may help determine what information is required for a particular project.

For *both* the project (impact) site *and* the mitigation site:

- Location Maps
- Topographic Maps
- Delineations and maps of all existing wetlands and other waters of the United States
- Soils maps and descriptions
- Information on the existing vegetation
- Descriptions of all water sources
- Depth, frequency, and duration of any temporary or permanent water
- Frequency and duration of any soil saturation within 12 inches of the surface
- Descriptions of the landform, geology, and topographic position on the landscape
- A brief water quality assessment of any water body associated with the sites
- Ownership information
- Recent, existing, and adjacent land uses
- Acreage and types of all existing wetlands and/or other waters of the U.S.
- Acreage, types, and functions of wetland and/or other waters of the U.S. to be gained or lost
- Descriptions of overall watershed functions to be gained or lost
- Sources of baseline information (including qualifications and experience of individuals)

For *only* the mitigation site:

- Site selection justification (see that section of the guidelines, numbers 1 through 10)
- Likelihood of success
- Future land use compatibility
- The proposed mitigation to impact ratios (in acres for wetlands and linear feet for streams)
- A water budget
- An aerial photograph
- Plan view drawings showing existing and proposed channels, wetlands and other waters, buffers, site boundaries, planting areas, structures, etc.
- A planting plan
- A construction schedule
- Before and after cross-sectional drawings of areas to be filled and/or excavated
- Construction methods
- Details of water control structures and tile outlets
- Seed source for any areas expected to revegetate naturally
- Performance standards
- Erosion control measures
- Plans for site protection and maintenance
- Monitoring plan
- Name and qualifications of person who will monitor the site
- Adaptive management plans
- Financial assurances

Deleted: