

Rock Island District (MVR)

Regulatory Branch

Mitigation and Monitoring Guidelines

May 2019 Version

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.

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).

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,

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.

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.

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. In some rare scenarios (impact is very close to a HUC 6 boundary, etc.) replacement may take place across HUC 6 boundaries.

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.

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.

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

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

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

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.

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.

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.

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

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.

Applicants should also consider the following when developing a 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.
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.
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.
5. Choose contractors and consultants who are familiar with the Section 404 permit program and who have previously had success at providing mitigation.
6. Complete the mitigation site construction prior to or concurrent with impacting the aquatic resource at the project site when practicable. 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.
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.
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).

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.

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.

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.

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.

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

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.

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.

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

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.

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.

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.

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

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

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 of 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.

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

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.

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 and Regional Supplements 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.

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.

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.

Permit process and compensatory mitigation for linear projects (transportation projects/pipelines/transmission lines. (June 17, 2019)

First, determine your permit area, or permit areas, & if you have a single and complete project.

Whether it is an IP or NWP, your scope of analysis could be similar to the project depicted on the left or right in attached Figure 1. If a segment of the project triggers an IP, then you should review the entire overall linear project as an IP. For example, in Figure 1, Project 1, if segment A triggers an IP, you would evaluate Segments A,B & C together in the IP. In this case, your scope of analysis for NEPA would be the individual segments A, B & C. In Figure 2, the scope of analysis would be the entire route, including uplands.

If you have a new highway on existing alignment, such as expanding a 2 lane to a 4 lane, you have more flexibility in what is a single and complete project, and different segments may be able to be done utilizing a NWP with multiple actions under the same Corps Number.

If you have a new highway through new alignment, you are more likely to evaluate project as an IP, such as Project 2, as it may be more difficult to segment into single and complete projects.

When evaluating a linear project, all impacts to WOUS within the permit area/areas should be considered and accrued (cumulatively) for compensatory mitigation. This includes both wetland and streambed loss.

Wetland impacts accrue for the overall project, with wetland mitigation being triggered at 0.1 acres of cumulative impacts, and stream mitigation being triggered after the accumulation of more than 300 linear feet of streambed loss (i.e. starting at 301 linear feet, compensatory mitigation should be required for the full 301 linear feet). Note: Regardless of whether or not you have a linear project, compensatory mitigation can be required for stream or wetland impacts on any project, even if it meets the conditions of a NWP, once it has reached the PCN threshold. For Example if you have a very high quality stream segment (i.e. trout stream, state protected waterway, reference quality stream, etc.) you could require compensatory mitigation for 100 feet of stream bed loss. Just because some NWPs allow 300 lineal feet of streambed loss, does not mean that compensatory mitigation cannot be required.

Examples:

1. You have a linear project (i.e. transportation/pipeline/transmission line) with 10 crossings. Crossing #1 will impact .02 acres of wetlands, crossing #2 will impact 0.2 acres of wetlands, & crossings #3 through #10 will impact .02 acres of wetlands. Your cumulative impact is .2 acres of wetlands, for which mitigation will be required.
 - a. Add 100 linear feet of stream bed loss to this example. You would require compensatory mitigation for the .2 acres of wetlands, but not the stream impacts, as the project has not accumulated over 300 linear feet of stream bed loss.
2. If the stream impacts are at crossings, and the crossings will be restored or result in no loss of streambed, you can consider these as temporary impacts and not require mitigation.
3. Impact area 1 will require a stream channel to be culverted for 100 linear feet; Impact area 2 will require relocation of 100 linear feet of stream channel; Impact area 3 requires concrete lining of 150 linear feet of stream channel. Cumulative streambed loss is 350 lineal feet, therefore mitigation should be required, and 350 lineal feet of stream identified as the loss.

Scope of Analysis for Multiple Road Crossings

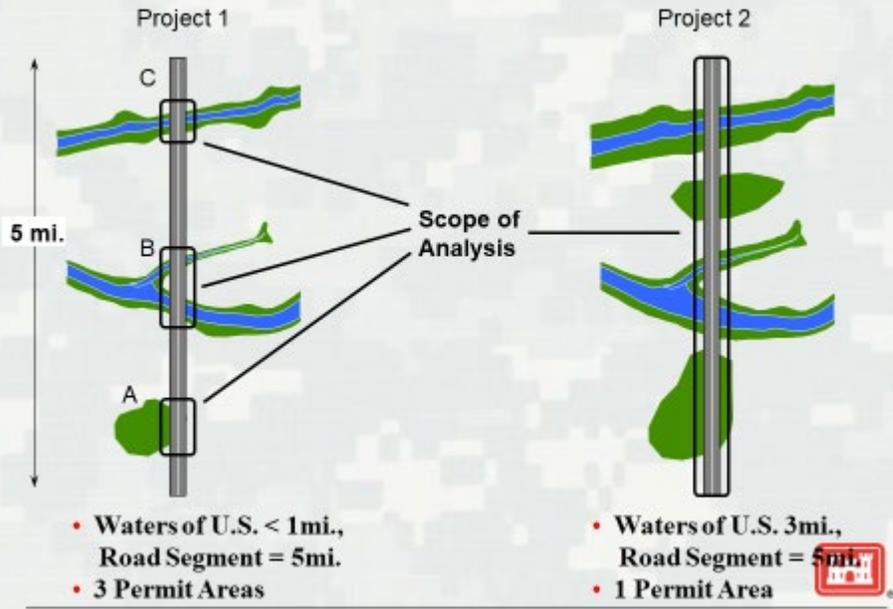


FIGURE 1

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

Wetland Mitigation Ratios

The below table represents a methodology of replacement ratios for both Bank purchases and Permittee Responsible Mitigation (PRM) that would satisfy compensatory mitigation requirements.

Ratio = Acre of required replacement : Acre of impact

1. Bank Baseline = 1:1 Replacement ratio	Permittee Responsible Baseline: Emergent Wetland=1.5:1, Forested Wetland=2:1
2. Secondary Service Area= +1	Outside HUC 8 but within HUC 6 = +0.5 Outside HUC 6 (If allowed)= +1.5
3. Out of Kind (see below)= +1	Out of Kind (see below) = +1
4. High Quality*/Protected Resource= +1-3 -Quality Tables (below) shall only be used for +2 and +3 categories.	High Quality/Protected Resource = +1-3 -See below for Quality Tables below.

Max for Bank Purchase 6:1

Max PRM= 7.5:1

1. The Baseline ratio for Banks purchase starts at a 1:1 ratio because banking provides more certainty, increased quality and eliminates temporal functional loss. The baseline ratio for PRM is elevated to 1.5 for emergent wetlands and 2.0 for forested wetlands to account for temporal lag, uncertainty of success and overall risk. The baseline value should be used for any impacted wetland which includes monocultures of species and farmed wetlands, among other poor quality sites.

2. Bank Secondary service areas automatically get a +1 due to pre-established IRT requirements. These service areas are made during the bank review and can be found on the RIBITS website or the Banking Instrument for the approved mitigation bank. Since service areas are not established during PRM mitigation review, a different process must be established to ensure compliance with watershed approach of the mitigation rule. The 0.5 increase would be required if the PRM mitigation is taking place outside of the HUC 8 where the impacts are occurring, but within the same HUC 6. This factor would only increase by 0.5 because most primary service areas (for banks) extend outside of the HUC 8 in which the bank occurs. This would provide increased ratios for impacts located further away from the mitigation site, but would not penalize the applicant excessively if they replaced the lost resources within a relatively close proximity to the impact site. In some rare scenarios (impact is very close to a HUC 6 boundary, etc.) replacement may take place across HUC 6 boundaries. In this case, the ratio would increase by +1.5. No increase in ratio, for this category, may be appropriate if the applicant has documented that their selection of the mitigation location was made using a holistic watershed approach.

3. Out of kind replacement is generally discouraged, but may be accepted in some circumstances. This is applicable usually only where the out of kind impact is a small fraction of the overall impact. Out of kind replacement can only be accepted if the impact amount is 25%

or less of the overall wetland impact, not to exceed 0.25 acre. Open water or stream mitigation will not be allowed when replacing wetland loss and visa-versa.

4. A category of High Quality Resources/Protected Resource has also been added for unique scenarios of resource impact (fens, bogs, high quality/rare vegetation, etc.). This is a sliding range because the additional ratio would require site specific consideration to determine the quality of the impacted resource. The most valued resource would result in adding 3 points to the total ratio required. This would include fens, bogs and resources with state/federally endangered vegetative species present. This category also includes any successful mitigation sites that were used to offset a separate and previous Corps authorization. As bank credits are required to meet stringent standards for vegetative quality which surpasses the amounts shown in the +1 and +1.5 categories, they generally do not require an increase due to the quality of an impacted site. Wetland Bank purchases should only incur an increase in the event that impacted wetlands have a quality value which meets the +2 or +3 category below.

Emergent Wetland Quality Table

+1	+1.5	+2	+3
>10 Native Hydrophytes/acre <20% Invasive Species Cover	>15 Native Hydrophytes/acre <10% Invasive Species Cover	>20 Native Hydrophytes/acre <5% Invasive Species Cover	Fens, Bogs. Or, Protected Resource

Forested Wetland Quality Table

+1	+1.5	+2	+3
≥ 5 Native Hydrophytic Tree Species/acre. <20% Invasive Species Cover	≥5 Native Hydrophytic Tree Species/acre including at least 2 Mast Producing Trees. <10% Invasive Species Cover	≥7 Native Hydrophytic Tree Species/acre including at least 2 Mast Producing Trees <10% Invasive Species Cover	≥7 Native Hydrophytic Tree Species/acre including at least 2 Mast Producing Trees with 50% of trees greater than 24 inch dBH. <5% Invasive Species Cover. Or, Protected Resource

See the Invasive/exotic species list in Appendix XX

Success Criteria

Impacted Wetland Condition

Please see the following condition tables which were established for emergent and forested wetland types. These tables should be used to establish a pre-construction condition (Baseline, Level 1, Level 2) for the wetlands being impacted as part of a Corps authorized project. This established condition will allow the project manager to select quantitative amounts to be used in the applicable success criteria. This scale should be used to determine the appropriate values associated with red text below. If the impacted site conditions qualifies for two separate levels of the table, use the lower of the two categories of the scale.

Emergent Wetland Success Criteria Scale (Impacted Wetland)

Baseline	Level 1	Level 2
<10 Native Hydrophytes/acre, and/or ≥20% Invasive Species Cover	≥10 but <20 Native Hydrophytes/acre, And/or ≥10% but <20% Invasive Species Cover	≥20 Native Hydrophytes/acre, And/or <10% Invasive Species Cover

Forested Wetland Success Criteria Scale (Impacted Wetland)

Baseline	Level 1	Level 2
5 or less Native Hydrophytic Tree Species/acre, And/or ≥20% Invasive Species Cover	5 or 6 Native Hydrophytic Tree Species/acre including at least 2 Hard Mast Producing Trees, And/or ≥10% but <20% Invasive Species Cover	7 or more Native Hydrophytic Tree Species/acre including at least 2 Hard Mast Producing Trees, And/or <10% Invasive Species Cover

Vegetation Conditions

Emergent

- a. Upon the completion of your monitoring period, each acre of the wetland mitigation site must contain at least **XX (Baseline=10, Level 1=15, Level 2=20)** native and hydrophytic (FAC, FACW, OBL) emergent vegetative species.

b. The wetland portions of the mitigation site shall reach 75% total vegetative cover by the end of the monitoring period. The percent coverage of native hydrophytic (FAC, FACW, OBL) vegetation within the mitigated wetland shall be a minimum of 70% of the total vegetative species.

Forested

c. Upon the completion of your monitoring period, the mitigated forested wetlands site must contain a minimum of XX (Baseline=5; Level 1= 5 species, 2 must be hard mast producing; Level 2=7 species, 2 must be hard mast producing) tree species per acre. (Insert acceptable native species based on site). None of the tree species shall comprise more than 20% of the planted tree total. Planted trees will either be containerized or bare root seedlings and shall be evenly distributed across the mitigated forested wetland areas.

d. If, at any time during the monitoring period, the total number of planted live trees falls below 100 per acre, supplemental planting shall be completed within the same or following growing season. The monitoring report following the supplemental planting shall document the plantings and the resulting number of live trees per acre. All planting shall be completed to ensure compliance with the diversity and density requirements, described above.

e. At the end of the monitoring period, there must be at least 100 native planted, hydrophytic (FAC, FACW, OBL) trees per acre with live growth at, or above, five feet. A minimum of 75 of the 100 trees per acre shall have diameters of two inches or more at breast height.

f. The understory of the forested areas shall reach 70% total vegetative cover by the end of the monitoring period. The percent coverage of native hydrophytic (FAC, FACW, OBL) vegetation within the mitigated wetland shall be a minimum of 65% of the total vegetative species.

Invasive

g. Non-native, aggressive, invasive species should account for no more than XX %(Baseline=20%, Level 1=15%, Level 2=10%) aerial coverage in any 50-foot by 50-foot area within the wetland mitigation site. Non-native, aggressive, invasive species include: reed canarygrass, phragmites, purple loosestrife, garlic mustard, flowering rush, Canada thistle, purple crown vetch, autumn olive, hairy cupgrass, leafy spurge, glossy buckthorn, amur honeysuckle, morrow's honeysuckle, tatarian honeysuckle, bell's honeysuckle, Eurasian water milfoil, Japanese knotweed, common buckthorn, and multiflora rose, or others determined in writing by the USACE or those found on the MVR Excluded Species list, found here:

<http://www.mvr.usace.army.mil/Portals/48/docs/regulatory/Wetland%20Plant%20List%202016/Iowa%20Excluded%20Species%20List.pdf?ver=2017-02-28-162652-807>.

h. Any 50-foot by 50-foot areas that have more than XX %(Baseline=20%, Level 1=15%, Level 2=10%) aerial coverage of non-native, aggressive, invasive species shall be immediately treated and/or managed until less than XX %(Baseline=20%, Level 1=15%, Level 2=10%) of that area is covered in non-native, aggressive, invasive species.

i. Total cover of Non-native, aggressive, invasive species will be restricted to no more than **XX** % (Baseline=15%, Level 1=10%, Level 2=5%) cover of the entire site.

Upland Buffer

j. Upon the completion of your monitoring period, each acre of buffer shall contain at least 10 native plant species. Buffers must have at least 75% total vegetative cover by the end of the monitoring period. The percent coverage of native perennial species shall be a minimum of 50% of the total cover.

Planting Recommendations

The following planting rates are recommended for vegetation success. If the proposed planting rates differ than what is outlined below, the reasoning should be specifically discussed in the mitigation plan for the proposal and will require explicit approval from the Corps. These recommendations are not meant to be included in permit conditions. The recommendations below should be incorporated into an applicant's mitigation plan as necessary.

Trees

Trees and shrubs should be planted at a rate of at least 109 containerized woody plants per acre on an approximate 20' x 20' spacing or 436 bare root seedlings per acre on an approximate 10' x 10' spacing. Containerized trees should be 3-6 feet tall with a minimum ½-inch caliper reading at the root flair. No individual species of hard mast-producing bottomland trees (pin oak, swamp white oak, shellbark hickory, pecan, etc.) shall exceed 20% of the overall planting. Sycamore, river birch, and dogwood species may be incorporated into the planting scheme provided their combined numbers do not exceed 50% of any single restoration area.

Emergent

Emergent wetland areas should be seeded at a rate of at least 10 lbs. of pure live seed per acre to increase the diversity of native herbaceous wetland plants within the proposed emergent wetlands and the maintained open areas within forested wetlands. Native plant plugs also may be used within standing water in conjunction with or in substitution of seed. Oats and/or winter wheat shall be incorporated into the seed mix to serve as a nurse crop.

Pollinator

To promote pollinator health, you should consider herbaceous and tree plantings that will provide at least three blooming species each season (spring/ summer/fall).

Hydrology Conditions

a. Upon the completion of your monitoring period, hydrology shall meet the minimum requirements as defined in the '87 Manual and its Supplement. This requirement includes soil saturation (within 12 inches of ground surface), inundation, or a combination of saturation and inundation for at least 14 consecutive days during the growing season in the majority of years.

Hydrology will be monitored by the applicant, utilizing at least X (at least 1 upland, 1 wetland and 1 within each vegetative community) groundwater monitoring wells with data provided to the Corps to establish the acreage of existing wetlands for the purpose of approving the mitigation site.

b. All groundwater monitoring wells will be will be constructed and installed according to the USACE's "Technical Standard for Water-Table Monitoring of Potential Wetland Sites" technical note (ERDC TN-WRAP-05-2, June 2005).

Common Name	Latin Name	Indicator	Notes
Box elder	<i>Acer negundo</i>	FAC	
Silver maple	<i>Acer saccharinum</i>	FACW	
Ohio buckeye	<i>Aesculus glabra</i>	FAC	
River birch	<i>Betula nigra</i>	FACW	
American hornbeam	<i>Carpinus caroliniana</i>	FAC	
Northern pecan	<i>Carya illinoensis</i>	FACW	
Shellbark hickory	<i>Carya laciniosa</i>	FACW	
American chestnut	<i>Castanea dentata</i>	FAC	
Common hackberry	<i>Celtis occidentalis</i>	FAC	
Common persimmon	<i>Diospyros virginiana</i>	FAC	
Black ash	<i>Fraxinus nigra</i>	FACW	
Green ash	<i>Fraxinus pennsylvanica</i>	FACW	
Kentucky coffeetree	<i>Gymnocladus dioicus</i>	FAC	
Sycamore	<i>Platanus occidentalis</i>	FACW	
Balsam poplar	<i>Populus balsamifera</i>	FACW	
Eastern cottonwood	<i>Populus deltoides</i>	FAC	
Quaking aspen	<i>Populus tremuloides</i>	FAC	
Swamp white oak	<i>Quercus bicolor</i>	FACW	
Northern pin oak	<i>Quercus ellipsoidalis</i>	FAC	Northern Reaches
Overcup oak	<i>Quercus lyrata</i>	OBL	
Bur oak	<i>Quercus macrocarp</i>	FAC	
Pin oak	<i>Quercus palustris</i>	FACW	
American willow	<i>Salix discolor</i>	FACW	
Black willow	<i>Salix nigra</i>	FACW	
Bald cypress	<i>Taxodium distichum</i>	OBL	
American elm	<i>Ulmus americana</i>	FACW	

Common Name	Latin Name	Indicator	Notes
Speckled alder	<i>Alnus incana</i>	FACW	Northern Reaches
Smooth alder	<i>Alnus serrulata</i>	OBL	Southern Reaches
Shrub indigo	<i>Amorpha fruticosa</i>	FACW	
Black chokeberry	<i>Aronia melanocarpa</i>	FACW	
Pawpaw	<i>Asimina triloba</i>	FAC	
Common buttonbush	<i>Cephalanthus occidentalis</i>	OBL	
Pagoda dogwood	<i>Cornus alternifolia</i>	FAC	
Silky dogwood	<i>Cornus amomum</i>	FACW	Southern Reaches
Swamp dogwood	<i>Cornus obliqua</i>	FACW	
Gray dogwood	<i>Cornus racemosa</i>	FAC	
Redosier dogwood	<i>Cornus sericea</i>	FAC	
Eastern wahoo	<i>Euonymus atropurpureus</i>	FAC	
Eastern swamp privet	<i>Forestiera acuminata</i>	OBL	Southern Reaches
Deciduous holly	<i>Ilex decidua</i>	FACW	Southern Reaches
Northern spicebush	<i>Lindera benzoin</i>	FACW	
Sandbar willow	<i>Salix interior</i>	FACW	
Common elderberry	<i>Sambucus nigra</i>	FAC	
American bladdernut	<i>Staphylea trifolia</i>	FAC	
Arrow wood	<i>Viburnum dentatum</i>	FAC	

Stream/Wetland Mitigation Plan Requirements

Permittee Responsible Mitigation

U.S. Army Corps of Engineers, Rock Island District

As a result of the implementation of the Mitigation Rule (Compensatory Mitigation For Losses of Aquatic Resources, 33 CFR Part 332) dated April 10, 2008, should your project require wetland mitigation, specific information is required to be submitted with the permit application and during the review process.

I. Permit Application and Initial Review Process.

a. **Sequencing.** For any project which will impact streams or wetlands, the applicant must include a statement explaining how impacts to Waters of the U.S. associated with the proposed activity are to be avoided, minimized, and, if needed, compensated.
[33 CFR 332.1(c)]

b. **Draft Mitigation Plan.** If compensatory mitigation will be required, then the applicant must submit a draft mitigation plan with the permit application. The draft mitigation plan must be sufficient for the Corps to conduct its application review process. At a minimum, the draft plan must include a location map, site plan with grading and seeding plans, and an operations and maintenance plan. Refer to the Rock Island District Mitigation and Monitoring Guidelines. For a Department of the Army (DA) Individual Permit, the review will include issuing a public notice for comment. For a DA General Permit, this may include a coordinated review with other federal and state agencies.

II. Final Mitigation Plan.

A final mitigation plan may be submitted with the permit application or later after the review process has been completed. The final mitigation plan must be prepared and approved prior to the Corps issuing the DA Permit. Your final mitigation plan must contain the following components, or an explanation as to why certain components should not be required:

a. **Objectives.** A description of the resource type(s) and amount(s) that will be provided, the method of compensation (i.e. restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions of the compensatory mitigation project will address the needs of the watershed, eco-region or other geographic area of interest [33 CFR 332.4(c)(2)].

b. **Site Selection.** A description of the factors considered during the mitigation site selection process. This should include consideration of watershed needs, onsite alternatives where applicable, and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation site [33 CFR 332.3(d) & 33 CFR 332.4(c)(3)].

c. **Site Protection Instrument.** A description of the legal arrangements and instrument, including site ownership, that will be used to ensure long-term protection of the compensatory mitigation site. This may include a deed restriction, restrictive covenants, or a conservation easement. The appropriate instrument is dependent on the project situation and who will be providing long-term maintenance of the mitigation site. The document will need to be filed with the title at the County Recorder's Office. An alternative may be to record the final Department of the Army Permit, Section 401 Water Quality Certification, and attachments [33 CFR 332.4(c)(4) & 33 CFR 332.7(a)].

- d. Baseline Information. A description of the ecological characteristics of the proposed compensatory mitigation site. This may include descriptions of historic and existing hydrology, historic and existing plant communities, soil types, and a map showing the location of the proposed compensatory mitigation site in relation to the project site. The baseline information must also include a wetland delineation of the proposed compensatory mitigation site. [33 CFR 332.4(c)(5)].
- e. Determination of Credits. A description of the number of credits to be provided, including a brief explanation of the rationale for this determination. This should include an explanation of how the compensatory mitigation project will provide the required compensation for unavoidable impacts to aquatic resources resulting from the permitted activity. [33 CFR 332.4(c)(6) & 33 CFR 332.3(f)].
- f. Mitigation Work Plan. Detailed written specifications and work descriptions for the compensatory mitigation project, including, but not limited to, the geographic boundaries of the project; construction methods, timing and sequence; source of hydrology including connections to existing waters and uplands; methods for establishing desired plant communities; plans to control invasive and non-native species; establishment of upland buffers; the proposed grading plan including elevations and slopes of substrate; soil management and erosion control. [33 CFR 332.4(c)(7)].
- g. Maintenance Plan. A description and schedule of maintenance requirements to ensure the continued viability of the compensatory mitigation site once initial construction is complete. [33 CFR 332.4(c)(8)].
- h. Performance Standards. Ecologically based standards that will be used to determine if the compensatory mitigation project is achieving its objectives. [33 CFR 332.4(c)(9) & 33 CFR 332.5]
- i. Monitoring Requirements. A description of parameters to be monitored in order to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and providing monitoring reports to the District Engineer must be included. A minimum of 5 years of monitoring will be required. For forested wetlands, 10 years of monitoring may be required. [33 CFR 332.4(c)(10) & 33 CFR 332.6]
- j. Long-Term Management Plan. A description of how the compensatory mitigation site will be managed after performance standards have been achieved and annual monitoring is no longer required to ensure long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management. [33 CFR 332.4(c)(11) & 33 CFR 332.7(d)]
- k. Adaptive Management Plan. A management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success. [33 CFR 332.4(c)(12) & 33 CFR 332.7(c)]
- l. Financial Assurances. A description of financial assurances (bonds, escrow accounts, etc.) that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed in accordance with its performance standards [33 CFR 332.4(c)(13) & 33 CFR 332.3(n)].