PUBLIC NOTICE

US Army Corps
of Engineers
Rock Island District

Permit No. MWAM
Issue Date: May 6, 2016
Expiration Date: June 5, 2016

30-Day Notice

REQUEST FOR COMMENTS ON USE OF THE PROPOSED MISSOURI WETLAND ASSESSMENT METHOD (MWAM) FOR WETLAND MITIGATION

The five U.S. Army Corps of Engineers (Corps) Districts in the State of Missouri (Kansas City, Little Rock, Memphis, Rock Island, and St. Louis Districts) are proposing to adopt the MWAM for determining mitigation requirements for impacts to jurisdictional wetlands in the State of Missouri.

The MWAM was developed in response to state and Federal resource agency requests for Corps implementation of a standard tool for the assessment of wetland impacts and mitigation actions to be used in all Corps Districts in the State of Missouri. The MWAM, if adopted, will be the primary tool used for the evaluation of wetland impacts and mitigation proposals for Section 404 of the Clean Water Act (33 USC 1344) Department of the Army permit evaluations within the State of Missouri.

BACKGROUND: In 2008, the Corps assembled a team comprised of experienced Regulatory Program Project Managers and representatives from state and Federal agencies to develop this method in compliance with the Corps and U.S. Environmental Protection Agency (USEPA) joint regulation for Compensatory Mitigation for Losses of Aquatic Resource; Final Rule (Federal Register / Vol. 73, No. 70 Pages 19594-19687, April 10, 2008) (herein referred to as Mitigation Rule http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/mitigation/FinalRule_Apr2008.pdf). This team also considered other applicable national guidance, available scientific research, statewide policies and Regulatory Project Manager experience with mitigation issues in Missouri. The DRAFT MWAM is online at http://www.mvr.usace.army.mil/Missions/Regulatory/PublicNotices.aspx .

COMMENTS: This notice solicits input from the public on the DRAFT MWAM, especially on the ability of the method to provide for appropriate assessment impacts to wetland functions, and proper crediting of actions undertaken to provide replacement of lost aquatic functions. Any interested party is invited to submit to this office written facts, suggestions or objections relative to the DRAFT MWAM on or before the public notice expiration date. All comments received will be considered in the Corps decision to adopt the MWAM as is, issue with modification, or conduct further analysis.

COMMENT SUBMITTAL: Comments on the DRAFT MWAM can be submitted to Mr. James Reenan at the U.S. Army Corps of Engineers, Kansas City District, Missouri State Regulatory Office, 515 East High Street, Suite 202, Jefferson City, Missouri, 65101 or by email at james.s.reenan@usace.army.mil. Comments relating to the MWAM are due by close of business June 5, 2016.

Department of the Army
Corps of Engineers

State of Missouri
Wetland Assessment Method

April 2016

Table of Contents

GENERAL INFORMATION 2
Introduction 2
Applicability 2
Purpose 3
General Guidelines 3
Point of Contact 5
MITIGATION FOR WETLANDS 5
Definition of Mitigation Factors Used in Tables and Worksheets. 5
Mitigation Criteria. 10
Glossary 10
Tables and Worksheets 14
Authorizing Signature 23
Literature Cited & References 24

GENERAL INFORMATION

Introduction

This document is meant as a guide to implement wetland mitigation in Missouri. Nothing in this method supersedes or alters the requirements of the U.S. Army Corps of Engineers (the Corps) and U.S. Environmental Protection Agency (USEPA) joint regulations for compensatory mitigation, as published in: Compensatory Mitigation for Losses of Aquatic Resources; Final Rule. 2008. Federal Register Volume Number 73/70; 19594-19705, hereinafter referred to as the Mitigation Rule, which governs planning, implementation, and management of permittee-responsible and third party compensatory mitigation projects. Compensatory wetland mitigation generally means the manipulation of the physical, chemical, and/or biological characteristics of a wetland with the goal of enhancing or replacing its natural functions. The purpose is to compensate for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization have been achieved. Compensatory mitigation may be required for impacts to all wetland types and should be designed to restore, enhance, and maintain wetland uses that are adversely impacted by authorized activities. Compensatory mitigation can include restoration, enhancement, establishment, and preservation.

Compensatory wetland mitigation is determined through the implementation of current Regulatory Guidance, best professional judgment, through the public interest review process. This assessment method has been established to supplement current guidance, and provide a consistent rationale to determine appropriate compensatory wetland mitigation for wetland impacts resulting from Department of the Army permit authorizations in the State of Missouri. This method should be used when assessing mitigation for impacts to wetlands, and in assessing credits for wetland mitigation, unless prior approval is received from the Corps.

Application of this method will result in two numbers (debits and credits); debits being the adverse impacts of a project and credits representing the functional lift of a project. The mitigation credits must equal or exceed the adverse impact debits resulting from the project. In rare cases, a variance may be granted when credits do not equal or exceed debits (i.e. mitigation in endangered species habitat). Additionally, in some cases, the evaluation of the site may reveal that the proposed wetland compensation measures are not practicable, constructible, or ecologically desirable; this determination will be made at the discretion of the Regulatory Project Manager.

Applicability

This mitigation assessment method is applicable to Department of the Army Section 404 Regulatory permit actions requiring compensatory mitigation for adverse ecological effects where more rigorous, detailed studies are not considered practical or necessary. This method is only for wetlands. It should be applied in the following manner based on the location of project impact and type of system impacted.

**Note: If the project affects a linear stream system, an analysis utilizing the State of Missouri Stream Mitigation Method would be required.*

This method may not be appropriate for evaluation of every project. This method does not address mitigation for categories of effects other than ecological (e.g., historic, cultural, aesthetic). This method does not replace or modify any requirements given in the Section 404(b) (1) Guidelines or other applicable documents regarding avoidance, sequencing, minimization, etc. Such requirements shall be evaluated during consideration of permit applications. This method was developed in coordination with state and Federal agencies to enhance its effectiveness and acceptability. When this method is used in the establishment of a Mitigation Bank, the Corps will consult with the Interagency Review Team (IRT), in accordance with IRT procedures, and the Mitigation Rule. Also, note that this document is subject to periodic review and modification. This is an internal guidance document and does not provide a private or citizens' right-of-action.

This method is not certified for use in Corps Civil Works ecosystem restoration and mitigation projects. In May 2005, the Corps established a Model Certification process known as the Planning Models Improvement Program (PMIP) to review, improve and validate analytical tools and models for Corps Civil Works business programs [Engineering Circular (EC) 1105-2-407]. The EC requires use of certified models for all planning activities and tasks the Ecosystem Restoration Planning Center of Expertise (ECO-PCX) to evaluate the technical soundness of models used in ecosystem restoration and mitigation projects. This method is not encumbered by the EC and will undergo separate evaluation by ECO-PCX should Corps Civil Works Planning have an interest in using this methodology.

Purpose

This method will serve as a tool for calculating debits and credits that result from a proposed project. It forms a basic written framework which will provide predictability and consistency for development, review, and approval of wetland compensatory mitigation plans. A key element of this method is establishment of a procedure for calculating wetland mitigation credits. While this method is not intended for use as project design criteria, appropriate application of the method should minimize uncertainty in development and approval of mitigation plans and allow expeditious review of applications. However, nothing in this method should be interpreted as a promise or guarantee that a project which satisfies the guidelines given herein will be assured of approval. The District Engineer (DE) has a responsibility to consider each project on a case-by-case basis and may determine in any specific situation that authorization should be denied, modified, suspended, or revoked. Following the guidelines herein does not confer any absolute guarantee of mitigation acceptability. Site specifics of a particular project may warrant alternative mitigation requirements.

General Guidelines

Parts 1 through 14 of Section 332.4(c) of the Mitigation Rule discuss the requirements for submittal and approval of mitigation plans and the essential elements to be contained therein; item 6 refers specifically to the determination of credits. Credit means a unit of measure (e.g., a functional or areal measure or other suitable metric) representing the accrual or attainment of aquatic functions at a compensatory mitigation site. The measure of aquatic functions is based on the resources restored, established, enhanced, or preserved.

1. *Units of Measure*: For the purpose of calculating debits and credits, units of measure shall be made in accordance with the following guidelines:

    a. *Before and After Basis of Measure*

        i. *Before the Impacts*: Units used in calculating debits, at the impact site, are based on the existing condition of the aquatic area before the impacts and its future without the proposed project. For example, if a forested wetland is to be filled or graded to create a farming operation, then the required mitigation credits shall be calculated based on the existing condition, which is a forested wetland, not a farmed wetland. The proposed impact area evaluation baseline shall be the area as it existed prior to any recent alterations, such as clearing, ditching, sedimentation, etc.

        **The Corps/IRT has the final authority to determine which alterations constitute a recent activity.*

        ii. *After the Mitigation*: Units used in calculating proposed mitigation credits are based on the conditions of the aquatic area expected to exist after the mitigation actions. For example, if a mitigation action restores a farmed wetland to a forested wetland, then the proposed mitigation credits are calculated based on the units of the resulting forested wetland, not the existing farmed wetland.

    b. *Area Units of Measure*: Calculations shall use acres to determine final credits.

2. *Adverse Impacts Area*: The area of adverse impacts as used in this document includes aquatic areas impacted by activities such as filling, excavating, flooding, draining, or clearing. For the purposes of this section, adverse effects or impacts include:

    a. Direct effects (Primary Impacts), which are caused by the action and occur at the same time and place.

    b. Indirect effects (Secondary Impacts), which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.

3. *Mitigation Area*: In general, the adverse impacts and compensatory mitigation are geographically distinct areas. The aquatic area in which the adverse effects occur will generally not be given credits as part of the compensatory mitigation area. Individual wetland functions mitigated on separate sites may be considered as an option if this mitigation better compensates for the functions or services lost.

A compensatory mitigation area may not be given credits under more than one mitigation category nor credited more than once under any category. However, it is acceptable to subdivide a given area into sub-areas and calculate credits for each sub-area separately. For example, a specific piece of a mitigation parcel may be credited for restoration or preservation but not both. An aquatic area that is

enhanced by improving hydrology and by buffering should be given one net enhancement credit calculation, not separate credits for both types of enhancement. An aquatic area that contains some restoration (e.g., plugging ditches) and some enhancement (e.g., improved hydrology) could either be subdivided into a restoration area component and an enhancement area component, or the entire area could be lumped together and given one net enhancement/restoration credit calculation. Whether or not an area is subdivided or lumped for the purpose of credit calculations is a case-by-case decision based on what is reasonable and appropriate for the given mitigation proposal.

Point of Contact

Copies of this document will be made available on the district website for each Corps District in the State of Missouri; Kansas City, Little Rock, Memphis, Rock Island, and St. Louis.

MITIGATION FOR WETLANDS

Definition of Mitigation Factors Used in Tables and Worksheets.

Control/Protection: An appropriate real estate instrument, approved in advance by the Corps, will be required to ensure long-term protection. Which of the instruments below is appropriate for the subject property may vary depending on the situation.

- *Conservation easement* means a legally binding recorded instrument approved by the Corps to protect and preserve mitigation sites by giving protection and enforcement rights by real estate interest to a third party.

- *Deed restriction* means a provision in a deed limiting the use of the property and prohibiting certain uses. The District approves mitigation areas and requires deed restrictions to protect and preserve mitigation sites. If the applicant can demonstrate that the mitigation activity will occur within a right-of-way easement and if the easement will offer protection and preservation of the site, such as associated with highway projects, the credit will be considered the same as that for deed restriction of the mitigation site.

- *Restrictive covenant* means a legal document whereby an owner of real property imposes perpetual limitations or affirmative obligations on the real property.

- *Conservancy* means transferring fee title to a qualified, experienced, non-profit conservation organization (NPO) or government agency. Non-profit organization means an entity recognized and operating under the rules of the Internal Revenue Service for non-profit purposes.

  *The Corps/IRT has the final authority to determine whether an NPO is qualified and experienced.

Credit Schedule (i.e., Timing) means the relative timing when the mitigation will be performed. Mitigation schedules are reviewed and approved on a case-by-case basis.

Banks: All Mitigation Banks qualify for **Credit Schedule 1** since sponsors generally sell a majority of their credits only after the physical development of the compensation site(s) are completed.

In-lieu-fee (ILF): ILF programs qualify for **Credit Schedule 3** since sponsors generally initiate compensatory mitigation projects only after collecting fees, and there has often been a substantial time lag between permitted impacts and implementation of compensatory mitigation projects.

User Note: If an ILF program sponsor proposes an ILF mitigation project in a specific geographic service area and all the advance credits in that service area have either been completely fulfilled with release credits from an ILF project (preferably with additional release credits that can be released at a later time based on a credit release schedule in the mitigation plan) or 100% of the advance credits are available for sale, then at the discretion of the reviewing Regulatory project manager a credit schedule 1 or 2 may be acceptable.

Permittee-responsible mitigation will be evaluated by one of the following schedules;

Credit Schedule 1: 80 to 100 percent of the construction and any planting components specified in the mitigation work plan are completed before the wetland impacts occur.

Credit Schedule 2: At least 50 but less than 80 percent of the construction and any planting components specified in the mitigation work plan are completed prior to and/or concurrent with the wetland impacts.

Credit Schedule 3: Less than 50 percent of the construction and any planting components specified in the mitigation work plan will be completed prior to and/or concurrent with the wetland impacts.

Cumulative Impact is an evaluation of the cumulative adverse impacts to aquatic sites for the overall project. This factor is proportional to the acres of impacts. The cumulative impact factor equals 5% of the sum of the aquatic resource adverse impact areas for the overall project. When computing this value, round the nearest tenth.

Degree of Threat is an assessment of the level of imminent risk of loss or damage to a system. The existence of a demonstrable threat will be based on clear evidence of proposed destructive land use changes or habitat alterations that are consistent with local and regional land use trends.

Dominant Impact categories are defined as follows:

- *Clear* means to remove vegetation in a manner that results in a discharge of dredged or fill material or is within the project scope of analysis.

- *Drain* means ditching or excavation that results in the removal of water from an aquatic area; causing the area or a portion of the aquatic area to change over time to a non-aquatic area or to a different type of aquatic area.

- *Dredge* means to dig, gather, pull out, or excavate from waters of the U.S.

- *Fill* means depositing material, which has the effect of changing the bottom elevation of any portion of a water of the U.S.

- *Impound* means to convert a riverine or wetland system to a lentic state with a dam or other detention/control structure.

- *Shade* means to shelter or screen by intercepting radiated light or heat. Examples of projects causing shading impacts include bridges, piers, and buildings on pilings.

Duration means the length of time (years) the adverse impacts are expected to last. Any impact lasting longer than one year shall be considered a permanent impact.

Existing Condition means the degree of disturbance relative to the ability of the site to perform its physical, chemical, and biological functions. This factor evaluates site disturbance relative to the existing functional state of the system.

- *Fully functional* means that the typical suite of functions attributed to the system type are functioning naturally. Existing disturbances do not significantly alter important functions. For example, aquatic areas with non-functional ditches or swales (no effective drainage), minor selective cutting, temporarily cleared utility corridors, or old logging ruts.

- *Slightly impaired* means that site disturbances have resulted in partial or full loss of one or more functions typically attributed to the given system type but functional recovery could be reversed through natural processes. Examples include clear-cut wetlands or riparian zones for riverine waters, aquatic areas with ditches that impair but do not eliminate wetland hydrology, or wetlands with maintained cleared utility corridors.

- *Impaired* means that site disturbances have resulted in major impairment of several functions typically attributed to the system type, and functional recovery is unlikely to occur naturally. Restoration activities are probably necessary for such recovery. Examples include areas that have been converted to monoculture, areas that are severely fragmented and areas degraded by a high percentage of non-native and/or invasive plant species.

- *Very impaired* means sites where many functions typically attributed to the system type have been lost due to site disturbances and full functional recovery would require major restoration effort. Examples include filled areas, excavated areas, or effectively ditched wetlands where the hydrology is significantly altered.

Kind is a factor used to compare the relative functions and services of the mitigation site to the impacted site. For Mitigation Banks, kind categories are defined for each bank unit after an assessment of the banking proposal using the watershed approach. For ILF mitigation, kind categories will be defined when a project specific plan is approved. For mitigation proposals not involving Mitigation Banks and ILF mitigation, kind categories are In-Kind and Out-of-Kind.

- *In-Kind Mitigation* means a resource of a similar structural and functional type to the impacted resource.

- *Out-of-Kind Mitigation* means a resource of a different structural and functional type from the impacted resource.

- *Categories:*
    - *Category 1 is 100% In-Kind or environmentally preferred option*
    - *Category 2 is 80%-99% In-Kind and remainder Out-of-Kind*
    - *Category 3 is 60%-79% In-Kind and remainder Out-of-Kind*
    - *Category 4 is 40 %-59% In-Kind and remainder Out-of-Kind*
    - *Category 5 is <40% In-Kind*

Location applies only to permittee-responsible mitigation projects. Mitigation Banks and ILF programs cannot be evaluated by this factor since they are planned and approved independently of the impacts that these programs will assume responsibility for. Therefore, when a Mitigation Bank or ILF program is proposed to fulfill the compensatory mitigation requirement, the Adverse Impact Factors Worksheets allow each Corps District to determine whether an increased compensation ratio is needed to account for impacts beyond the geographic service area of Mitigation Banks or ILF programs.

- *Hydrologic Unit Code* (HUC): standardized watershed classification system developed by United States Geological Survey (USGS).

- *Ecological Drainage Unit* (EDU): group of watersheds that share common ecological characteristics developed by the Missouri Resource Assessment Partnership (MoRAP).

- *Locations:*
    - *Location 1:* Mitigation site inside the 8-digit HUC where impacts occur.
    - *Location 2:* Mitigation adjacent to impacted 8-digit HUC and inside EDU.
    - *Location 3:* Mitigation non-adjacent to impacted 8-digit HUC but inside EDU.
    - *Location 4:* Mitigation adjacent to impacted EDU (outside service area).
    - *Location 5:* Mitigation non-adjacent to impacted EDU (outside service area).

Aquatic Resource Type categories are based on the suite of functions that they perform and are defined as follows.

- Type A:
    - Fens and seeps (flowing in excess of 90 days)
    - Wooded wetland, with canopy height greater than 6 meters
    - Wet and wet-mesic bottomland prairie (as defined by Nelson, 2010)
    - Riverine wetlands (those wetlands occurring at or below bankfull width on streams)

- Type B: (unless specifically identified under Type A)
    - Emergent wetlands
    - Wooded wetland, with canopy height less than 6 meters

    - Scrub-shrub wetland

- Type C:
    - Wetlands farmed under normal circumstances (annually for at least 3 of 7 years), which includes wetlands classified as "FW" by the USDA Natural Resources Conservation Service
    - Man-made impoundments, open water
    - Fringe wetlands on man-made impoundments or ponds

Other habitat types not categorized above or considered a rare type or special circumstance will be evaluated and assigned a category ranking by the Project Manager on a case-by-case basis with consideration of any comments provided by the resource agencies and/or a public interest review.

Priority Category means designated areas of aquatic systems that provide functions of recognized importance because of their inherent functions, their position in the landscape, or their rarity. This includes both the immediate contiguous watershed and the adjacent wetlands.

Primary priority areas are those which provide important contributions to biodiversity on an ecosystem scale or high levels of functions contributing to landscape or human values. Impacts to primary priority areas should be rigorously avoided and minimized. Compensation for impacts in these areas should emphasize replacement nearby and in the same watershed.

Designated Primary Priority Areas include the following or wetlands directly abutting or adjacent to one of the following:

- Outstanding National and State Resource Waters
- Designated Cold-water fisheries not including tailwaters
- Waters officially designated by the Corps as high priority areas
- National Wildlife Refuges
- Old growth climax communities that have unique habitat structural complexity likely to support rare communities of plants or animals*
- And the following category of rare aquatic systems: Sand ponds

* This wetland assessment will not supersede the obligations under the Endangered Species Act to conserve federally listed species. Section 7 consultation with the U.S. Fish and Wildlife Service, when appropriate, may identify further measures necessary to avoid and minimize adverse effects to listed species and critical habitat (i.e., surveys, conservation measures, a Biological Assessment, a Biological Opinion and Incidental Take Statement). The outcome of this consultation could influence changes to the potential score associated with the worksheets.

Secondary priority areas include the following categories of vulnerable or uncommon aquatic systems that do not fall into the designated primary priority category:

- Wetlands adjacent to waters in Category 4 or 5 of the current Clean Water Act Section 305(b) Integrated List where the impairment is affected by factors influenced by the wetland services.
- Within the same 12-digit HUC as the primary priority area.

Tertiary priority areas include the following category of aquatic systems and those that did not fall into the designated primary or secondary priority category:

- Waters of the U.S., excluding streams (i.e., ponds)

Temporal Loss is a factor designed to compensate for the temporal loss of wetland or aquatic area functions due to a time lag in the ability of the enhanced, restored or created mitigation area to fully replace functions lost at the impact site. This factor is measured in years. Different systems will require different time to reach levels of functional capacity level with the impact site. For example, if a mature bottomland hardwood wetland is impacted, it may take up to 60 years to replace all functions including structural habitat complexity, whereas replacement of functions in an emergent wetland situation may take much less time (e.g., 5 to 15 years).

Vegetation means the plant material within a defined area. Related terms used in this method include:

- Natural revegetation involves no planting and allows natural (i.e., passive) recolonization of plant species/communities
- Planted means using seeds, transplanted, or nursery stock of native species that are appropriate to the location and/or ecosystem type

Mitigation Criteria

The Federal goal of no net loss of wetlands shall be achieved regardless of this approved mitigation method. However, this method will further help ensure that this goal is met, while taking into account selected environmental factors. Simply stated, the mitigation criteria requires that, for a mitigation proposal to be acceptable, the proposed mitigation credits must be equal to or greater than the required mitigation credits. In accordance with the Federal goal of no net loss of wetlands, the area (in acres) proposed for restoration or establishment mitigation must be equal to or greater than the area (in acres) that is proposed to be impacted. Additionally, the remaining credits required for mitigation can be obtained through other opportunities, such as preservation, enhancement, and enhancement through buffering.

Glossary

The acronyms, abbreviations, and terms used in this document are in accordance with the definitions given in the Mitigation Rule. Certain additional terms are defined as follows:

Adverse effects as used in this method means any adverse ecological effect on wetlands including all filling, excavating, flooding, draining, clearing, or similar impacts to wetlands. Other categories of effects such as aesthetic, cultural, historic, health, etc., are not addressed by this method.

Aquatic Resource Types:

- *Emergent Wetland*: characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except sub-tidal and irregularly exposed. (See Cowardin, 1979)

- *Farmed Wetland*: wetland that prior to December 23, 1985, was manipulated and used to produce an agricultural commodity; and on December 23, 1985, did not support woody vegetation; and met the following hydrologic criteria:
    i. Is inundated for 15 consecutive days or more during the growing season or 10 percent of the growing season, whichever is less, in most years (50 percent chance or more).
    ii. If a pothole, playa, or pocosin, is ponded for 7 or more consecutive days during the growing season in most years (50 percent chance or more) or is saturated for 14 or more consecutive days during the growing season in most years (50 percent chance or more). (See 61 FR 47025).

- *Fen*: a rare, permanently saturated natural community where soils are saturated from the upwelling of mineral-rich groundwater. Water sources include small single point groundwater seeps, areas with frequent or shallow-flowing rivulets and braided streamlets; or small open pools of water through most or all of the growing season. (See Nelson, 2010)

- *Fringe Wetland*: wetlands adjacent to lakes and ponds where the water elevation of the lake maintains the water table in the wetland. Additional sources of water are precipitation and ground water discharge. (See Brinson, 1993)

- *Riverine Wetland*: all wetlands and deepwater habitats contained within a channel. (See Cowardin, 1979)

- *Scrub-Shrub Wetland*: areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes except sub-tidal are included. This resource type may represent a successional stage leading to Forested Wetland, or they may be relatively stable communities. (See Cowardin, 1979)

- *Seep*: a small area of groundwater discharge, either non-forested or shaded by trees rooted in adjacent, upland habitats; seeps generally support characteristic herbaceous wetland species but are too small or narrow to support hydrophytic woody vegetation. (See Nelson, 2010)

- *Wet-Mesic Bottomland Prairie*: a dense cover (100 percent) of grasses mixed with forbs and sedges approximately 4 to 7 feet tall (by midsummer) dominates along with scattered shrubs. Grasses achieve the tallest height. Sub-layers of forbs and sedges occur. This resource type is found in depression areas on poorly drained terraces and on floodplains of larger streams and rivers. (See Nelson, 2010)

- *Wet-Bottomland Prairie*: a dense cover (100 percent) of perennial grasses mixed with forbs and sedges approximately 4 to 7 feet tall (by midsummer) dominates along with scattered shrubs. Grasses achieve the tallest heights and sub-layers of forbs and sedges occur. Plant diversity is lower than wet-mesic bottomland prairie due to prolonged flooding. This resource type is found in floodplains of narrow and larger rivers and rarely in upland prairie depressions or swales. (See Nelson, 2010)

- *Wooded Wetland*: areas characterized by woody vegetation that is 6 m tall or taller. (See Cowardin,1979)

Aquatic site means any water of the U.S., including jurisdictional wetlands.

Buffer zone means a defined area intended to separate, protect, and maintain certain functions of an aquatic system from upland development or other adverse effects.

Compensatory mitigation means compensating for adverse effects by replacing or providing substitute resources or environments. Compensatory mitigation for aquatic areas addressed by this evaluation method includes:

- *Enhancement* differs from restoration because the objective of enhancement is usually to improve one or two functions within a wetland, which may result in a decrease in the performance of other functions. Increasing those particular functions does not change the amount of area occupied by the aquatic resource. In contrast, re-establishment and rehabilitation (which are forms of restoration) are intended to return most, if not all, natural and/or historic functions to a former or degraded aquatic resource.

- *Establishment* (Creation) means the conversion of non-aquatic habitat to aquatic habitat. Wetland establishment usually includes grading, providing a suitable substrate, hydrology, and establishment of appropriate vegetation.

- *Preservation* means the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in gain of aquatic resource area or functions.

- *Restoration* means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

- *Re-establishment* means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

- *Rehabilitation* means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not result in a gain in aquatic resource area.

***IN DISTINGUSIHING BETWEEN RESTORATION AND ENHANCMENT THE PROJECT MANAGER MUST EVALUATE THE EXISTING LAND USE. IF THE SITE IS AN EXISTING

WETLAND AND THE GOAL IS TO IMPROVE UPON EXISTING WETLAND FUNCTIONS, VALUES, BENEFITS AND/OR USES; THIS WILL BE CONSIDERED ENHANCEMENT. IF THE SITE HAS A GOAL OF RE-ESTABLISHING HYDROLOGY, PLANTS, SOILS, OR WATER QUALITY THAT WAS ONCE PRESENT, AND NOW GONE, THIS WILL BE CONSIDERED RESTORATION.

Effect includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Further, the Council on Environmental Quality stated that effects include:

- Direct effects, which are caused by the action and occur at the same time and place
- Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable
- Cumulative effects which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions

IRT stands for Interagency Review Team. An interagency group designated by the local Corps District, to review and consult with proponents regarding Compensatory Mitigation Bank and/or ILF proposals.

Special aquatic sites means wetlands, mud flats, vegetated shallows, coral reefs, riffle and pool complexes, sanctuaries, and refuges as defined at 40 CFR 230.40 thru 230.45.

Threshold means the level, point, or value above which something is true or will take place and below which it is not true or will not take place. For the purposes of this method, the thresholds given herein are considered to be the level of adverse impacts caused by the proposed project above which the project fails to meet the conditions, limitations, restrictions, or other requirements specified in relevant laws or regulations.

Tables and Worksheets

ADVERSE IMPACTS TABLE - DEBITS

Factors	**Options**					
Aquatic Resource Type	Type C -1.0		Type B 2.0		Type A 3.0	
Priority Category	Tertiary 0.5		Secondary 1.5		Primary 2.0	
Existing Condition	Very Impaired -1.0	Impaired 1.0		Slightly Impaired 2.0		Fully Functional 2.5
Duration	Temporary (<1 year) 0.2			Permanent 2.0		
Dominant Impact	Shade 0.2	Clear 1.0	Dredge 1.5	Drain 2.0	Impound 2.5	Fill 3.0
Cumulative Impact	0.05 x Wetland Acreage Impacted per Column					

Note: The Cumulative Impact Factor is a mathematical calculation that addresses the scope of wetland impact for each individual column recorded on the Adverse Impact Factor Worksheet. The corresponding value for each column shall be determined by multiplying a 0.05 constant by the acreage of wetland impacted per column (0.05 x acreage of wetland impacted per column). This factor considers those columns with greater affected acreage of wetlands to have more extensive adverse affects on wetland function than those columns containing lesser amounts of affected wetlands. When computing this factor, round to the nearest tenth place using even number rounding. Thus 0.01 and 0.050 are rounded down to give a value of 0.0 while 0.051 and 0.09 are rounded up to give 0.1 as the value for the cumulative impact factor. **The cumulative impact factor for the overall project must be used in each area column on the Required Mitigation Credits Worksheet below.**

ADVERSE IMPACTS TABLE SAMPLE WORKSHEET - DEBITS

Factor	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**
Aquatic Resource Type					
Priority Category					
Existing Condition					
Duration					
Dominant Impact					
Cumulative Impact					
Sum of Factors (R)					
Impacted Area (AA)					
Credits (C) = R x AA					
Compensation Ratio					
TOTAL REQUIRED CREDITS=					

***Compensation Ratio** – *when the Corps determines that a third party mitigation source is acceptable to fulfill compensatory mitigation requirements the total credits determined on this worksheet shall be applied to Mitigation Banks or ILF programs at a 1:1 ratio when the impact area is within an approved service area. However, an increased compensation ratio may be used at the Corps discretion when an impact occurs beyond the geographic service area of an approved Mitigation Bank or ILF program.*

Enhancement by Buffering: If the buffer zone meets the requirements specified below, a portion of the buffered aquatic site will qualify for enhancement credit. **No more than half of required non-preservation credits (from restoration, establishment, and/or enhancement) may be generated through buffering. Calculation of buffers cannot be utilized under the preservation worksheet, <u>only the enhancement worksheet.</u>**

1. *Qualitative Considerations*: The following issues should be considered when evaluating buffers in terms of the overall quality and general acceptability of a mitigation plan.

    a. In order to assure that buffers serve the intended use in perpetuity, they must be protected by covenants, easements, or other approved measures. Buffers without acceptable protective measures will not be included in calculation of credits.

    b. Buffers or portions of buffers may be excluded from calculation of credits if their contribution to system integrity is of questionable value due to shape, condition, location, inadequate or excessive width, or other reasons (e.g. around drained wetlands which require restoration to maintain hydrologic viability).

    c. Buffers may not include aquatic areas. It is not allowable to designate aquatic areas as buffer to satisfy buffering goals. The credited buffer must consist of uplands.

2. *Quantitative Considerations*: Buffers should be of adequate width to restore, enhance, or maintain the physical, chemical, and biological integrity of the buffered waters. Minimum buffer widths eligible for credit are found in the tables below. The numbers vary based on land use, aquatic system type, and slope. Buffers that do not meet the minimum width or mean width requirements will not be included in calculating credits. The following steps should be followed to determine enhancement by buffering credits:

To determine the minimum buffer width:

Step 1: Use the Minimum Buffer Width table below to determine the minimum mean buffer width for your proposed or existing land use. These widths are not required, unless obtaining buffer credit.

MINIMUM BUFFER ZONE WIDTHS FOR ENHANCEMENT BY BUFFERING CREDIT FOR WETLANDS (0-5% SLOPE)*

Land Use	Min. Mean Buffer Width (ft)	Min. Buffer Width (ft)
Single Family Residential	25	15
Multi-Family Residential	40	15
Commercial	50	20
Industrial	75	25
Landfill	75	25
Other Categories (Golf Course, Agriculture, etc)	case-by-case	
*Widths are based on linear, constant elevation measurement.		

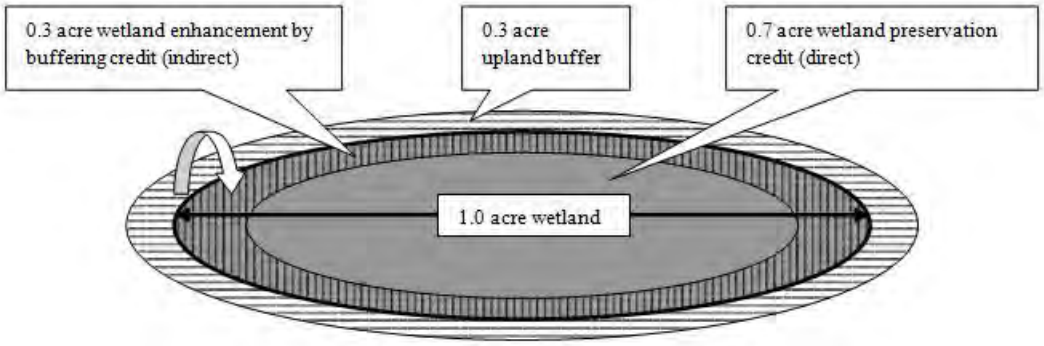
Step 2: Multiply the width determined in Step 1 by the appropriate multiplier from the Slope Multiplier Table below.

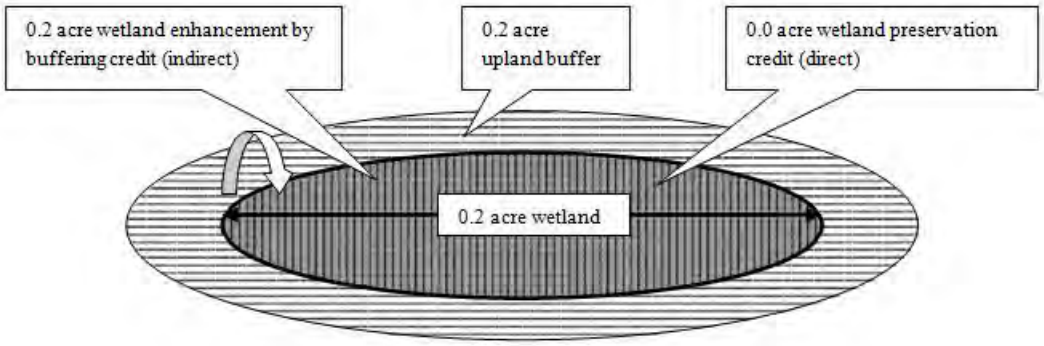
SLOPE MULTIPLIER TABLE
Percent Slope Perpendicular to Wetland Multiplier Factor for Minimum and Minimum Mean Widths

Less than 5%	1x
5% - 20%	2x
21%-40%	3x
Greater than 40%	4x

To determine area eligible for indirect enhancement by buffering credits:

Step 3: Calculate the total acreage of the proposed upland buffer (must meet the minimum buffer width determined in Step 2). Buffers will not be given direct enhancement credits. It is assumed that an equivalent area within the perimeter of the wetland is enhanced; therefore this acreage is given indirect credits (in other words, the upland buffer is “flipped” inward to determine the enhancement by buffering area). See the following illustration.





Step 4: Multiply the value determined in Step 3 by the appropriate value in the table below (based on the percentage of the wetland perimeter that is buffered).

AREA FOR ENHANCEMENT CREDITS BY BUFFERING

Aquatic Area Protected By Buffer	Enhanced Aquatic Area Equals the Lesser of The Protected Aquatic Area OR
More than 95%	1.0x The Buffer Area
25% to 95%	% Area Protected x The Buffer Area
Less than 25%	Allowed only on a case-by-case

To determine the remaining area eligible for preservation credits after enhancement by buffering credits have been calculated:

Step 5: Subtract the value determined in Step 3 from the total wetland acreage

Note: The acreage of the protected aquatic site that receives credit for enhancement by buffering may not be counted for preservation credit as well. (An illustration of this concept is found above.)

RESTORATION TABLE.

RESTORATION MITIGATION FACTORS FOR WETLANDS - CREDITS

Factors	**Options**				
Control	Corps approved site protection without third party grantee 1.0			Corps approved site protection recorded with an approved third party grantee, or transfer of title to a conservancy 2.0	
Temporal Loss	*N/A 0	>20 Years -0.3	10-20 Years -0.2	5-10 Years -0.1	0-5 Years 0
Credit Schedule	Schedule 3 0.2		Schedule 2 0.4		Schedule 1 0.6
Kind	Category 5 -0.1	Category 4 0	Category 3 0.2	Category 2 0.4	Category 1 0.8
**Location	Location 5 0	Location 4 0.1	Location 3 0.3	Location 2 0.4	Location 1 0.8

*Not Applicable
**Location Factor only applies to permittee-responsible mitigation

PROPOSED RESTORATION MITGATION SAMPLE WORKSHEET - CREDITS

Factor	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**
Control					
Temporal Loss					
Credit Schedule					
Kind					
Location					
Sum of Factors(M)					
Mitigation Area(A)					
M × A=					
TOTAL RESTORATION CREDITS = Σ M x A					

ENHANCEMENT TABLE

ENHANCEMENT MITIGATION FACTORS FOR WETLANDS - CREDITS

Factors	**Options**				
Control	Corps approved site protection without third party grantee 0.5		Corps approved site protection record with and approved third party grantee, or transfer of title to a conservancy 1.0		
Temporal Loss	*N/A 0	>20 Years -0.3	10-20 Years -0.2	5-10 Years -0.1	0-5 Years 0
Credit Schedule	Schedule 3 0.1		Schedule 2 0.3		Schedule 1 0.5
Kind	Category 5 -0.1	Category 4 0	Category 3 0.1	Category 2 0.2	Category 1 0.5
Location	Location 5 -0.1	Location 4 0	Location 3 0.1	Location 2 0.3	Location 1 0.4

*Use this option to calculate credits for enhancement by buffering
**Location Factor only applies to permittee-responsible mitigation

PROPOSED ENHANCEMENT MITIGATION SAMPLE WORKSHEET - CREDITS

Factor	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**
Control					
Temporal Loss					
Credit Schedule					
Kind					
Location					
Sum of Factors(M)					
Mitigation Area(A)					
M × A=					
TOTAL RESTORATION/ENHANCEMENT CREDITS = Σ M x A					

PRESERVATION TABLE

PRESERVATION MITIGATION FACTORS FOR WETLANDS - CREDITS

Factors	**Options**				
Priority Category	Tertiary 0.1	Secondary 0.2	Primary 0.4		
Existing Condition	Slightly Impaired 0	Fully Functional 0.1			
Degree of Threat	Moderate 0.1	High 0.2			
Control	Corps approved site protection without third party grantee 0.1	Corps approved site protection recorded with an approved third party grantee, or transfer of title to a conservancy 0.4			
Kind	Category 5 -0.1	Category 4 0	Category 3 0.1	Category 2 0.2	Category 1 0.3
**Location	Location 5 -0.1	Location 4 0	Location 3 0.1	Location 2 0.2	Location 1 0.3

Note: Preservation credit should generally be limited to those areas that qualify as Fully Functional or Slightly Impaired. Impaired sites should be candidates for enhancement or restoration credit, not preservation credit. In special circumstances when impaired sites are allowed preservation credit, a negative factor will be used to calculate credits as per the matrix table.
**Location Factor only applies to permittee-responsible mitigation

PROPOSED PRESERVATION MITIGATION SAMPLE WORKSHEET – CREDITS

Factor	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**
Priority Category					
Existing Condition					
Degree of Threat					
Control					
Kind					
Location					
Sum of Factors(M)					
Mitigation Area(A)					
M × A=					
Total Preservation Credits = Σ (M x A) =					

ESTABLISHMENT TABLE

ESTABLISHMENT MITIGATION FACTORS FOR WETLANDS - CREDITS

Factors	**Options**				
Vegetation	N.A. 0	Natural 0.3	Planted 0.5		
Control	Corps approved site protection without third party grantee 0.3		Corps approved site protection recorded with an approved third party grantee, or transfer of title to a conservancy 0.6		
Temporal Loss	>20 Years -0.3	10-20 Years -0.2	5-10 Years -0.1	0-5 Years 0	
Credit Schedule	Schedule 3 0.2	Schedule 2 0.4	Schedule 1 0.6		
Kind	Category 5 0.1	Category 4 0.2	Category 3 0.4	Category 2 0.6	Category 1 0.8
**Location	Location 5 0.1	Location 4 0.2	Location 3 0.4	Location 2 0.6	Location 1 0.8

N. A. = Not Applicable
**Location Factor only applies to permittee-responsible mitigation

PROPOSED ESTABLISHMENT MITIGATION SAMPLE WORKSHEET - CREDITS

Factor	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**
Vegetation					
Control					
Temporal Loss					
Credit Schedule					
Kind					
Location					
Sum of Factors(M)					
Mitigation Area(A)					
M x A =					
TOTAL ESTABLISHMENT CREDITS = Σ (M x A) =					

WETLAND MITIGATION SUMMARY WORKSHEET

Mitigation summary Worksheet for Permit Application #:_____

I	**Required Mitigation**	**Debits**
A	Total Required Mitigation = (Adverse Impact Table)	

II Proposed Mitigation Worksheet Totals - Credits

		Permittee Responsible	Bank/ILF
B	Establishment		
C	Restoration		
D	Enhancement (Non-Buffer)		
E	Enhancement (Buffer)		
F	Preservation		
G	Total Proposed Mitigation		

III Proposed Mitigation Type Credits Summary

		Permittee Responsible	Bank/ILF
H	Establishment		
I	Restoration		
J	Enhancement		
K	Preservation		
L	Total Proposed Mitigation		

IV Mitigation Worksheet Adjusted Totals Credits

		Permittee Responsible	Bank/ILF
M	Preservation (**must be <=50% of the total mitigation)**		
N	Restoration & Establishment		
O	Enhancement		
P	**Meets no net loss? (Restoration & Establishment must equal at least a 1:1 ratio with the Impacts)**		
Q	Total Adjusted Mitigation=		
R	Are the Total Adjusted Mitigation Credits (N) >= Total Credits Required (A)?		

Authorizing Signature

By the signature given below, this method is authorized for use.

Kansas City District:

Little Rock District:

Memphis District:

Rock Island District:

St. Louis District:

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