DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
69 A HAGOOD AVENUE
CHARLESTON, SOUTH CAROLINA 29403-5107

REPLY TO
ATTENTION OF

PUBLIC NOTICE

REGULATORY DIVISION **26 MAY 2006**
REFER TO: COMPENSATORY MITIGATION
STANDARD OPERATING PROCEDURES (SOP)
MAY 12, 2006 DRAFT

After using the 2002 mitigation SOP for several years, the State and Federal agencies realized that changes were needed in the document to properly reflect current State and Federal compensation goals and to clarify the document and its use. The attached document prepared by an interagency team reflects these efforts. The changes also represent efforts to provide clear direction for applicants as to what is considered appropriate compensation for unavoidable impacts to water resources in South Carolina.

The format has been changed, examples were improved, and tables were condensed to improve clarity and ease of use. The required credits per impact will increase to reflect current compensation goals; however this will be offset by an increase in the number of credits provided for compensation efforts. Buffer requirements were changed so that the SOP encourages improved buffers for compensation credits. The general nature of the SOP has not changed and most of the basic tenants such as the 25% restoration requirement per project remain the same. Digital spreadsheets will also be available to enhance and improve the use of the tables and calculations.

The overall impact of these changes should be that the SOP will be easier to use, will better reflect State and Federal compensation goals, and continue to provide SC with a compensatory mitigation strategy consistent across all of the involved agencies.

In order to give all interested parties an opportunity to express their views

N O T I C E

is hereby given that written statements regarding the proposed work will be received by of the above mentioned office until

12 O'CLOCK NOON, MONDAY, JUNE 26, 2006

from those interested in the activity and whose interests may be affected by the proposed work.

Mary Hope Glenn
Project Manager
Regulatory Branch
U. S. Army Corps of Engineers

Compensatory Mitigation Standard Operating Procedures

United States Army Corps of Engineers
Regulatory Division

May 12, 2006

1.1. Point of Contact

Copies of this document will be made available at http://www.sac.usace.army.mil/ on the Internet. Questions regarding use of this policy for specific projects must be addressed to the Project Manager handling the action. Other general inquiries or comments regarding this document may be addressed to:

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Attn: Mary Hope Glenn or Nat Ball, Regulatory Division
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Charleston, South Carolina 29403-5107
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1.2. Authorizing Signature

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

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2. Table of Contents

3. General Information

3.1. Applicability

This SOP is applicable to regulatory actions requiring compensatory mitigation for adverse ecological effects where more rigorous, detailed studies (e.g., Hydromorphological Methodology (HGM), Wetland Evaluation Technique (WET), Habitat Evaluation Procedure (HEP)) are not considered practical or necessary. This SOP should be applied in the following manner based on the location of project impacts and type of system impacted:

- Stream channels with bed and bank wetlands only. These systems are found primarily in the Piedmont of South Carolina. Use the linear system (stream) portion of this SOP to calculate mitigation on a linear basis.

- Riverine systems, stream channels with adjacent wetlands. In general, these systems should be replaced in-kind with riverine system mitigation on an acreage basis using the wetland portion of this SOP. However, if impacts are primarily to a stream channel or on a linear basis the linear system (stream) portion of this SOP should be used. Mitigation for Piedmont seepage wetlands will be calculated on an acreage basis using the wetland portion of this SOP.

- Braided stream systems, wetlands not associated with stream channels. Use the wetland portion of this SOP to calculate mitigation credits on an acreage basis.

Note that some projects will require use of both the wetland and linear portions of the SOP to determine appropriate levels of compensatory mitigation.

This SOP may not be appropriate for some large, complex projects. This SOP does not address mitigation for categories of effects other than ecological (e.g., historic, cultural, aesthetic). Mitigation measures such as avoidance and minimization are not addressed by this SOP. This SOP does not obviate or modify any requirements given in the 404(b)(1) Guidelines or other applicable documents regarding avoidance, sequencing, minimization, etc. Such requirements shall be evaluated during consideration of permit applications. This SOP was developed in coordination with State and Federal agencies to enhance its effectiveness and acceptability. When this SOP is used in the establishment of a Mitigation Bank, the Army Corps of Engineers (ACE) will consult with the Mitigation Bank Review Team (MBRT) with the goal of achieving a consensus regarding the factors, elements, and design of the Mitigation Bank Plan. Also, note that this document is subject to periodic review and modification. **This is an internal policy document, and does not provide a private or citizens' right-of-action.**

3.2. Purpose

The intent of this SOP is to provide a basic written framework that will provide predictability and consistency for the development, review, and approval of compensatory mitigation plans. A key element of this SOP is the establishment of a method for calculating mitigation credits. While this method is not intended for use as

project design criteria, appropriate application of the method should minimize uncertainty in the development and approval of mitigation plans and allows expeditious review of applications. **However, nothing in this SOP should be interpreted as a promise or guarantee that a project that satisfies the guidelines given herein will be assured of approval.** Site specifics of a particular project may warrant alternative mitigation requirements. 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.

3.3. Other Guidance

In addition to the policies and requirements set forth in this document, there may be other guidance provided by State or Federal agencies. For projects impacting less than a cumulative total of 0.25 acre of waters of the United States or 100 linear feet of streams, compensatory mitigation plans which have been approved by the State or NRCS, when applicable, will usually be considered acceptable. Projects impacting more than 0.25 acre of Waters of the United States or 100 linear feet of streams will usually have to satisfy the requirements of this document in addition to any requirements imposed by the State. The policies and regulations regarding mitigation are still evolving and it is possible that conflicting guidance may occasionally be provided. If a significant conflict is discovered between this document and any other relevant guidance, the applicant should notify the ACE of the conflict and request clarification before incorporating any such guidance into a proposed plan.

3.4. General Mitigation Guidelines

Mitigation must be designed in accordance with the following guidelines:

3.4.1. Mitigation Goals

This SOP is limited to evaluation of compensatory mitigation for adverse ecological effects. However, before compensatory mitigation is considered, other categories of mitigation should be evaluated. The Council on Environmental Quality has stated in 40 CFR Part 1508.20 that *mitigation* includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

To facilitate a timely review, applicants are encouraged to submit information demonstrating project planning and design consistent with the sequence listed above.

The goal of compensatory mitigation is the restoration and maintenance of the Nation's waters by replacing unavoidably lost wetland or stream functions. All such mitigation actions relate to one or more of the following.

- Biological Integrity involves the natural state of living organisms using aquatic systems. Biological functions include shelter, food production, breeding sites, and migration pathways.

- Chemical Integrity involves the natural composition and properties of inanimate substances within aquatic systems. Chemical functions include nutrient cycling, particulates retention, organic carbon export, removal and sequestration of elements and compounds, water quality improvement.

- Physical Integrity involves the natural contiguity of aquatic systems. Physical functions include flood attenuation, storm surge reduction, groundwater exchange, commercial and recreational navigation, and cultural uses such as swimming.

3.4.2. Qualitative Analysis

It must be determined that the general quality of the mitigation is acceptable. Certain general guidelines are included here for use in making this decision. However, it is impossible to provide all encompassing guidelines on all quality issues. Generally, the quality issue can be decided based on the answer to questions such:

- Is the plan likely to succeed?
- Is it appropriate?
- Does it replace lost functions?
- Is it enforceable?
- Is it ecologically beneficial?

If the answer to one of these, or similar questions, is no, then the plan may be of unacceptable quality and should probably be rejected regardless of quantitative considerations. Examples of proposals that might be rejected based on a quality analysis include:

- Restrictive covenants on property the permittee does not own. (Unenforceable - use conservation easement)
- Out-of-watershed preservation in another state.
- Buffers that provide no benefit to system integrity.
- Mitigation with resources that do not provide similar functional replacement relative to either individual or cumulative impacts. Such a determination should consider both the nature of the impacts for the individual project as well as cumulative impacts known or foreseeable within the larger landscape.
- Preservation of poor quality wetlands.
- Restoration proposals on systems that don't need to be restored.
- Creation of ponds as mitigation for filling wetlands.

3.4.3. Quantitative Analysis

After the initial quality analysis has been passed, then the mitigation plan is evaluated quantitatively. This is done using the equation method with the guidelines, credit calculation procedures and tables given in this SOP.

3.4.4. Units of Measure

For the purpose of calculating credits, units of measure shall be made in accordance with the following guidelines.

3.4.4.1. Before and After Basis of Measure

a. Before the Impacts. Units used in calculating required mitigation credits are based on the existing condition of the aquatic area before the impacts and its future without the proposed project. For example, if a riverine waterbody is to be impacted by impounding, then the required mitigation credits shall be calculated based on the existing condition, which is riverine waters, not impounded waters. The proposed impact area evaluation baseline shall be the area that existed prior to any recent (within approximately two years) alterations such as clearing, ditching, sedimentation, etc.

b. 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 an impounded waterbody to a natural riverine waterbody, then the proposed mitigation credits are calculated based on the units of the resulting riverine waters, not the existing impounded waters.

3.4.4.2. Linear and Area Units of Measure

a. Streams. A stream is defined as unimpounded portions of perennial and intermittent open surface waterbodies that flow in a linear or curvilinear direction due to a changing gradient along the flow line. The unit of measure for calculating credits is linear feet. Measurements for streams shall be along the centerline of the channel. Linear mitigation tables and definitions of factors can be found in section 6, Mitigation for Linear Systems (Streams).

b. Wetlands and other Waters of the U. S., excluding streams. For these systems, calculation of credits shall use acres as the unit of measure. The following are examples:
   - All ocean waters, ponds, lakes, ephemeral waters, naturally isolated waters, and wet meadows.
   - Mudflats, sand flats, adjacent wetlands, sloughs, and other aquatic areas that do not lie within the bank full boundaries of a stream or river system.
   - Braided stream systems.

3.4.5. Adverse Impacts Area

- The area of adverse impacts as used in this document includes aquatic areas impacted by filling, excavating, flooding, draining, clearing, or other adverse

ecological effects. Other categories of effects such as aesthetic, cultural, historic, health, etc., are not addressed by this document.

3.4.6. 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. For example, if a pond is excavated in wetlands with a resulting wetland fringe, the wetland fringe is generally not considered compensation for the excavation impacts. Similarly, an impoundment of a riverine system with a resulting increase in open surface water area or wetland fringe is not considered compensatory mitigation for the adverse impacts to the impounded riverine system.

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 restored aquatic area donated to a conservancy organization may be credited as either restoration or preservation but not both. An aquatic area that contains more than one type of restoration could either be subdivided into restoration area units or the entire area could be lumped together and given one 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.

3.4.7. Conservation Restrictions

All property used for mitigation credits (e.g. all created, restored, enhanced, and preserved sites and buffers) must be protected by suitable conservation restrictions. Depending upon the circumstances, as discussed below, suitable conservation restrictions may include deed restrictive covenants, conservation easement, or transfer in fee title. In some cases, ownership by a suitable conservancy organization or government agency may suffice. Shown below are a few of the typical considerations relevant to this subject.

- In order for covenants or easements to be considered acceptable they should be in accordance with the most recent edition of the samples maintained by the Corps. The current model documents will be internet available for downloading at http://www.sac.usace.army.mil/. Printed copies may be obtained directly from the Corps upon written request. The restrictive covenants model concurrent with this version of the SOP can be found under Section 8.2.

- Covenants, easements, and transfers in fee title must be duly executed and recorded with the appropriate local entity responsible for maintaining the public register of real property transactions.

- The restrictive covenants option is intended primarily for smaller tracts. Preservation of large tracts should be by means of easement or transfer in fee title to a conservation entity.

- The Corps reserves the right to review the draft covenant and easement language and will typically require a 30 to 45 day review period.

- Subdivision of preservation areas into individual lots for residential developments is strongly discouraged. To the maximum extent practicable, preserved areas should be placed in the undivided control of a single owner such as a property owners association, a conservancy organization, or any suitable owner with responsibility for enforcement of the preservation agreement. In the case of a permit for a subdivision, the conservation restrictions should be included in the developer or owner's own general scheme of restrictions for the subdivision.

- Review the samples available from the Corps for other requirements that may apply. Any exceptions to the general requirements stated here or any changes to the wording of the sample documents must be coordinated with and approved by the Corps' Office of Counsel prior to execution and recording.

3.4.7.1. Conservation Easements vs. Restrictive Covenants

For mitigation banks, conservation easements with third-party rights of enforcement or transfer in fee title to a conservation entity will be the protective mechanism. **Any exception to this policy must be pre-approved by the Office of Counsel.** For permitting situations, conservation easements or restrictive covenants, or both, may be used. However, if the applicant does not own the property on which they propose to place conservation restrictions, then a conservation easement will normally be required. In order to "own the property," the applicant must be the same legal entity as the landowner. If the applicant is an individual, and the landowner is a corporation, then they are not the same. Exceptions allowing the use of restrictive covenants where the applicant does not own the property must be pre-approved by the Corps' Office of Counsel.

3.4.7.2. Subdivisions

In the case of a permit for a subdivision, the permit will include a condition that the conservation restrictions be included in the developer or owners own general scheme of restrictions for the subdivision. The conservation restrictions to be included in the general scheme should be drafted by the CORPS Office of Counsel. In some cases the language of the general scheme of restrictions for the subdivision may be sufficient without additional CORPS restrictions, and in such cases the Office of Counsel may determine that the recording of a separate conservation restriction document is unnecessary. Also see the discussion of subdivisions in section 3.4.7, Conservation Restrictions.

3.4.7.3. Changes to Model Documents Before Recording

Changes necessary to customize a model document, such as filling in blanks, making the State a party to the document, and adding a description of the real property to be protected, may be approved by Regulatory Division personnel. Note well that the

property description must be sufficient to enforce the restrictions as intended. **Any other changes to a model document, such as additional exceptions or modifications of standard wording, must be approved by the Office of Counsel prior to execution or recording**, and are subject to approval on a case-by-case basis (note that exceptions approved in one case may not be suitable for another). **An applicant will be required to clearly identify all proposed model changes when the conservation restriction document is submitted for preliminary approval. If all changes are not clearly identified, the document may be returned to the applicant without approval.** When Office of Counsel approval of changes is required, Regulatory Division personnel will compare the proposed conservation restriction document against the model document and ensure that ***all*** changes are identified before submitting for Office of Counsel approval.

3.4.7.4. Record of Approval and Recording

The attorney's initials on the approved conservation restriction document will indicate office of Council approval. All conservation restriction documents must be recorded and filed prior to either the issuance of the permit or the transfer of the file from the project manager to the clerical staff for filing. Compliance with these conditions shall be the obligation of the project manager until the condition is satisfied.

3.4.7.5. Changes to Conservation Restriction Documents After Recording

"Changes" include amendments, trades, corrections, or any other modifications of a recorded document. Because the conservation restrictions are legal documents, **no change may be processed or agreed to without being pre-approved by the Office of Counsel**. Applicants will be informed that the restrictions are permanent and that changes should NOT be anticipated; even where provision for changes is made in the recorded document, changes are the exception, not the rule. Applicants desiring any change must submit a copy of the recorded document in question to the project manager and Office of Counsel prior to the issuance of any public notice involving modified conservation restrictions. The determination of whether and how a change may be made to a recorded conservation restriction will be made by the Office of Counsel based upon the language in the recorded document, applicable policy, and coordination with the Regulatory Division.

3.4.7.6. Enforcement

The Corps Regulatory staff will promptly notify the Office of Counsel when violations of conservation restrictions are detected. The resolution of all such violations will be coordinated with the Office of Counsel.

3.4.7.7. Database Requirements

All mitigation areas requiring conservation restrictions will be tracked by entry in the database. The database tracking system will include the type of mitigation (e.g. preservation, restoration), the quantity of each type of mitigation, the status of the restrictions (e.g. pending, approved, recorded), and the ***geographic*** location *(geocode)* of the area to be placed under conservation restrictions using either point or polygon GIS data.

3.4.8. Wetland Preservation

Wetland preservation mitigation must have perpetual protection through restrictive covenants, conservation easements, transfer in fee title or other approved protective measures setting the preserved areas aside as natural areas. Wetland preservation will also require adjacent upland buffers to be eligible for mitigation credit. In accordance with the goal of no net loss of aquatic functions, preservation only mitigation will generally not be allowed. **Preservation may not account for more than 75% of the total required wetland mitigation credits.**

Site condition should be considered when evaluating the general acceptability of a wetland for preservation. Preservation credit is generally limited to fully functional or partially impaired areas. Fully functional sites are those that are functioning naturally while partially impaired sites have partial loss of one or more functions.

Impaired sites should be viewed as candidates for restoration and not considered for preservation credit. Impaired sites are those that have major impairment of functions where recovery is unlikely to occur naturally. In special circumstances, impaired sites maybe allowed preservation credit within the scope of OCRM wetland master planned projects,

3.4.9. Buffer Zones

Upland buffers adjacent to aquatic areas help maintain the biological and chemical integrity. The relative importance of such buffers will depend upon a number of variables including the buffer width, forest condition, adjacent land uses and wildlife habitat requirements. Vegetated riparian buffers often provide the only filtering of surface runoff before it enters into streams. See items 5.2.1, and 6.9, Establishment of Natural Buffers for further information.

3.4.10. Restoration/Enhancement

Restored and enhanced mitigation sites must be protected by restrictive covenants or similar measures. Proposed restoration mitigation plans must include the following information.

- An explanation of what values or functions are being restored/enhanced and to what degree.
- A narrative description of how the restoration will be accomplished.

3.4.11. Wetland Creation

In designing creation mitigation, the selection of high quality upland habitat such as mature forested areas for conversion to wetland will not be acceptable. Designers should use good judgment in selecting sites for wetland creation. For example, a former agricultural field would be ecologically preferable to a mature forested area as a candidate for alteration. As with all mitigation areas, created mitigation sites must be protected by restrictive covenants or similar measures following the creation work. Wetland creation is generally discouraged based on its low success potential.

3.4.12. Lakes, Ponds, and Impoundments

Mitigation using lakes, ponds, and impoundments may be allowed as compensation for impacts to similar waterbodies. *Mitigation using lakes, ponds, or impoundments will generally not be acceptable as compensatory mitigation for adverse impacts to wetlands or riverine systems.* It is understood that open surface waterbodies provide some valuable public interest factors such as storm water storage, wildlife habitat, or ground water recharge. Therefore, in recognition of this fact, the adverse effect factors for flooding and impounding have been adjusted relative to other factors.

3.4.13. Location

Where practicable and environmentally desirable, mitigation should be at or near the project site and within the same watershed as the area of adverse impacts. Mitigation that fails to meet this standard will result in a lower credit value. Distant or out-of-watershed compensatory mitigation may not be acceptable and must be approved on a case-by-case basis.

3.4.14. Scheduling

When practicable and feasible, mitigation should be completed prior to or concurrent with the adverse impacts. The preferred method is to complete mitigation prior to the commencement of the impacts. However, it is recognized that because of equipment utilization it may be necessary to perform the mitigation concurrent with the overall project. This is usually acceptable provided the time lag between the impacts and mitigation is minimized and the mitigation is completed within one growing season following commencement of the adverse impacts. Justification should be provided for schedules showing less than 50% completion of the mitigation prior to commencement of the adverse impacts.

3.4.15. Maintenance

Mitigation areas should be designed to be naturally sustaining and not depend upon maintenance. Mitigation plans that require perpetual or long-term human intervention will generally not be approved. For example, plans requiring an energy subsidy (pumping, intensive management, etc.) will normally not be acceptable. The goal is to achieve a natural state.

3.4.16. Consultation

To minimize delays and objections during the permit review process, applicants are encouraged to seek the advice of resource and regulatory agencies during the planning and design of mitigation plans.

3.4.17. Processing Procedures

3.4.17.1. Information Required

The following information may be required for consideration of a mitigation proposal. Applicants are encouraged to provide several copies of proposals (usually eight) to expedite agency notification. Proposals will be reviewed and the applicant will be advised what additional information will be required to make the proposal adequate for consideration. Other information, not addressed herein, may be needed as part of the General Permit Notification process, Individual Permit process, or State procedures.

- Plans and detailed information regarding the work for which the mitigation is required.
- Drawings in accordance with the requirements given in this SOP.
- A summary table with the quantity of each category of impacted area and each category of mitigation must be shown.
- Names, addresses, and phone numbers for all parties responsible for mitigation and monitoring.
- A description of the existing conditions including vegetative communities of all areas to be affected by the proposed mitigation.
- A narrative discussion of the key elements of the proposed mitigation plan.
- A schedule showing start and completion dates for all significant activities.
- A listing of mitigation goals with quantifiable criteria for determining success.
- A proposed monitoring and contingency plan.
- Definitions for significant terms used in the plan.
- Description of the equipment, materials, and methods required for execution of the plan.
- Management plans, if necessary, for any mitigation maintenance.

3.4.17.2. Monitoring and Contingency Plans

The applicant will be required to monitor the mitigation area for success and to provide written reports describing the findings of the monitoring efforts. Because of the many variables involved, no specific standards are set forth. Instead, a monitoring plan should be submitted as a part of the mitigation proposal for review. Monitoring efforts usually include periodic reviews in the first years, as needed, and annually thereafter. The plan should include contingency measures specifying remediation actions to be followed should the success criteria or scheduled performance criteria not be fully satisfied. Monitoring and contingency plans and reports will typically address the following items, as applicable.

- A narrative of the key elements of the monitoring and contingencies plan.
- Names and contact info for parties responsible for the plan.
- A description of the baseline conditions (e.g., soils, hydrology, vegetation, wildlife).
- Schedules with start and completion dates for monitoring activities and reporting.
- Drawings in accordance with the requirements given in this SOP.
- A listing of measurable success factors with quantifiable criteria for determining success.
- Definitions for success factors and other terms used in the plan.
- Descriptions of equipment, materials, and methods to be used.
- Protective measures (e.g., restrictive covenants or conservation easements).
- Vegetation monitoring and contingency plans.
- Hydrological monitoring and contingency plans.
- Designation and reporting of reference sites.
- Photographic documentation and quantification of species survival rates.

- Bonding or other contingency measures.
- Alternative site provisions in case the mitigation site is determined unsuccessful.

3.4.17.3. Linear System Monitoring

Monitoring is generally conducted to determine whether the enhancement/restoration has accomplished the desired ecosystem effect. Both physical and biological monitoring will be required for major restoration projects. **For most restoration projects, both pre (baseline) and post construction surveys should be conducted.** Upon completion of the project, an as-built channel survey should be performed that documents the dimension, pattern and profile of the restored channel. Permanent cross-sections should be established at an approximate frequency of one per 20 (bankfull-width) lengths. The locations should represent approximately 50% pools and 50% riffles with some flexibility allowed. The locations of cross-sections should always include areas predisposed for potential problems. For narrow streams, two cross-sections per 1000 lf will generally be sufficient. The as built survey should also include photo documentation of all structures, a plan view diagram, a longitudinal profile, vegetation information, and a pebble count for a least six cross-sections (or all cross-sections if less than six are required). The longitudinal profile should be conducted for 30% of the restored reach or 3000 lf; whichever is greater.

Stream restoration should include a reference reach that would provide design criteria data and be used as the reference for monitoring success. The reference reach is generally a stable and relatively undisturbed stream of the same stream type (Rosgen, 1996), similar size, located in the same ecoregion and preferably the same or neighboring watersheds. In some cases, the reference reach could be the same stream either above or below the impacted area being restored.

Stream monitoring should be conducted annually for a minimum of five (5) years after completion of the enhancement/restoration activity. For restoration activities, it is essential to conduct monitoring after at least two bankfull events, preferably more. If less than two bankfull events occur during the first five years, monitoring will continue until the second bankfull event is documented. The bankfull events must occur in separate monitoring years. Monitoring data collected should include photos, plant survival analysis, channel stability analysis, and in some cases biological data. Monitoring requirements for smaller projects will be tailored to the size of the project and may include both physical and biological elements on a case-by-case basis. Methods for stream restoration monitoring are described in Rosgen, 1996 and The Federal Stream Restoration Working Group,

Physical Monitoring

The types of measurements and monitoring that will typically be required include, but are not limited to, flow characteristics, channel cross-sections, longitudinal profiles, substrate and sediment characteristics, other morphological characteristics (dimension, pattern and profile), channel stability (vertical and lateral), water temperature, dissolved oxygen, and turbidity. It is important that selected monitoring variables are sensitive enough to show

change and can be measured. Data sheets for determining stream type and dimension, pattern and profile are included in the appendix.

Biological Monitoring

Biological surveys are useful tools in determining the success of a restoration project. Biological surveys of stream fauna such as fish and macro-invertebrates should be used on projects that target, either directly or indirectly, in-stream habitat restoration. One acceptable method for biological monitoring in streams is the index of biological integrity (IBI). Surveys of flora should be made when buffers are being enhanced and when bioengineering techniques are being used for bank stabilization. Vegetation monitoring, which is required for most riparian restoration and bank stabilization projects, includes measurement of vegetation survival and growth (density, height, diameter at breast height, or other biomass measure). Potential biological parameters that may be monitored include, but may not be limited to density and diversity of fish, macro-invertebrates and other fauna.

3.4.17.4. Success Criteria

Success criteria will be used to determine the effectiveness in achieving restoration goals. **It is critical that success criteria selected for various monitoring measures are appropriate for demonstrating attainment of projected restoration goals.** For wetlands, this will often entail the restoration of natural hydrology demonstrated through appropriate monitoring. For stream systems, this may entail bringing an actively aggrading or degrading system into a state of dynamic equilibrium whereby the monitoring data will indicate stream channel stability and improved biological integrity.

3.4.17.5. Drawings

Mitigation plans should include drawings that conform to the current permit application procedures in accordance with the following:

a. Drawings must be on 8.5 x 11 inch paper. Drawings must be clear, readable, and reproducible on standard, non-color office copiers. For large or complex projects, plans should also be submitted on paper sized no smaller than 11 x 17 inch and no greater than 30 x 42 inch. Each drawing sheet should include:
   - an unused margin of no less than ¼ inch;
   - title block with applicant's name, project title, site location, drawing date, permit number, and sheet number;
   - all significant dimensions clearly annotated;
   - indicate the site's latitude and longitude on drawings and or maps;
   - a north arrow;
   - a graphic scale;
   - a clear, legible plan view indicating area sizes and length (e.g. square feet, acres, linear feet) for all mitigation sites.

b. Location maps for the proposed activity must be included. County road maps and a US Geological Quadrangle maps are preferred. The location maps must show

roads leading to the site and must include the street name or number. Each map must contain a title block.

c. Plan views of the proposed mitigation must be included. These drawings must show the general and specific site location and character of all proposed activities, including the relationship of all proposed work to nearby Waters of the United States.

d. For ground disturbing mitigation work, cross section views must be submitted depicting the existing ground contours and the proposed finished contours.

e. All aquatic areas within the project boundaries must be shown.

f. Mitigation areas must be shown (restorations, preservation, etc.).

g. A legend must be shown identifying cross-hatching, shading, or other marking techniques used.

h. Show the ordinary high water line of affected and adjacent non-tidal open surface waterbodies.

i. Show the mean high tide line and spring high tide line of affected and adjacent tidal waterbodies.

j. If the plan involves dredging in navigable waters, the drawings must include the method of dredging, plans for disposal, and a description of the material to be dredged.

k. If the plan includes discharge of dredged or fill material into Waters of the United States, the drawings must include the source, composition and quantity of the material, the method of transportation and disposal, and the disposal site.

l. For large or complex mitigation projects involving non-preservation mitigation (restoration, creation) certified drawings showing the topography of the completed mitigation area might be required. The drawings should also show types of plantings, locations of plantings, structures and all other significant work.

3.4.17.6. Distribution

For projects with proposals that are fully shown on a few pages, the Project Manager may include the proposal with the permit application public notice. When the proposal is distributed via public notice it must be clearly labeled as the mitigation proposal. One complete original along with at least one copy should be submitted for distribution via the public notice. Applicant may be requested to provide copies (usually eight) for reviewing agencies if the proposal includes material that is bound, voluminous, on paper larger than 8.5 x 11 inch size, not reproducible in black and white, or which for other reasons cannot

readily be distributed by means of the regular public notice mailings. For these larger, more complex projects information will not be distributed via public notice mailings in order to minimize reproduction and mailing costs.

3.5. Mitigation Banking

Proposals to establish mitigation banks will be processed in accordance with current joint state and federal processing procedures for the establishment and operation of mitigation banks. Proposals that use credits from a mitigation bank should be consistent with the provisions of this SOP as well as any conditions or restrictions applicable to the bank. Sample worksheets for application of this method to mitigation banks are included in the appendix.

3.6. References

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Brinson, M. M. 1993. "A Hydrogeomorphic Classification for Wetlands," Technical Report WRP-DE-4, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

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4. Guidance for internal use by CORPS Project Managers

4.1. Variance Approval

The following formula and table establish levels of authority for approval of mitigation plans where the proposed mitigation does not satisfy the SOP. The variance shown in the following table is the maximum variation that can be approved at the indicated level. This allowance for variance is intended for situations where the mitigation formula is found to be unreasonable or otherwise not in the public interest. This policy applies to approval of variances for the minimum restoration PMC and the total PMC. *The Project Manager should document the reasons for any approved variances.*

$$\text{Variance} = 100 \times \frac{\text{Required} - \text{Proposed}}{\text{Required}}$$

Variance	Approval Authority
up to 25%	Project Manager
up to 50%	Branch Chief
over 50%	Division Chief

4.2. Permit Conditions

In general, permits issued with a mitigation plan should include the following standard conditions. These conditions may be modified as appropriate on a case-by-case basis.

a. That the compensatory mitigation plan must be implemented expeditiously. The mitigation plan includes the following elements:

   [Note: Project manager should insert here a general description of the mitigation plan. For example: The compensatory mitigation plan is described in the above referenced Pre-Construction Notice and supplemental materials. The mitigation plan includes preservation of not less than 52.0 acres of aquatic area on the project site together with not less than 10.5 acres of undisturbed non-aquatic buffers and 5.5 acres of restoration. The locations of said areas to be preserved, buffered, and restored being shown on the above referenced drawing sheets.]

b. That evidence of completion of the mitigation plan must be submitted to the Corps not later than 60 days from the date of issuance of this [Note: Insert either "permit" for Individual Permits or "verification letter" for Nationwide or Regional General Permit verifications], or prior to commencement of the authorized work, whichever is later.

c. That preservation of property owned by the permittee shall be done by means of deed restrictive covenants, conservation easement or transfer in fee title to a conservation entity. Restriction of property not owned by the permittee at the

time the restrictions are executed must be done by means of conservation easement, or donation of the preservation area to an approved conservancy organization, and not by restrictive covenants.

d. That not less than 30 days prior to execution, the draft covenants, easement documents, or transfer in fee title must be submitted to the Corps for approval. Documentation must be submitted to the Corps within 30 days following approval of the drafts or prior to commencement of the authorized activity; whichever is later, evidencing the execution and recording. Samples for covenants and easements will be provided upon written request or may be obtained on the Internet at http://www.sac.usace.army.mil/.

4.3. Signature Authority

All actions regarding Mitigation Plans subject to this SOP may be signed at the appropriate authority level indicated below. Signature authority for actions that do not fall into one of the categories listed below shall be determined on a case-by-case basis.

4.3.1. Routine Actions.

The following categories of letters regarding projects subject to this SOP are considered routine actions and may be signed by Project Managers. Letters falling into the Standard or Special categories listed below shall be signed at the level indicated for those categories.

a. Letters responding to requests for information.
b. Letters requesting additional information from applicants.
c. Letters responding to requests for delineations or verification of delineations.
d. Letters approving mitigation monitoring reports.

4.3.2. Standard Actions.

The following categories of letters regarding projects subject to this SOP are considered standard actions and will be signed by the Chief of the Permit Evaluation Branch. Letters falling into the Routine or Special categories shall be signed at the level indicated for those categories.

a. Letters approving mitigation plans for Nationwide Permits.
b. Letters approving mitigation actions for resolution of enforcement actions.

4.3.3. Special Actions.

The following categories of letters regarding projects subject to this SOP are considered special actions and shall be signed by the Division Chief or his designated representative.

a. Letters of denial, disapproval, suspension, or revocation.
b. Letters authorizing or approving mitigation plan after any resource agency has recommended that the plan not be approved.

c. Letters imposing special conditions regarding a mitigation plan or modifications to a mitigation plan when the applicant has indicated they do not agreed with the conditions.
d. Letters authorizing or approving a mitigation plan when the proposed plan deviates significantly from the policies and guidance given in this SOP, excluding quantitative variances that are covered under Variance Approval.

5. Mitigation for Wetlands

5.1. Wetland Mitigation Credit Calculation

When compensatory mitigation is required, the mitigation plan will be evaluated using the mitigation factors tables. These calculations are not intended to represent an exact or statistically proven scientific method. Rather, the method is based on the judgment of regulatory and resource agency staff. It is intended to establish a clear, understandable, and consistent method for use by applicants and regulators. Factor tables and the definitions and explanations for all values and factors are provided below. Sample worksheets that demonstrate the methods are provided in section 8.1, Sample Cases. As additional experience with this procedure is gained, it is possible that the tables of factors will be reviewed and adjusted. Always use the most recent approved edition of these tables.

Simply stated, for a mitigation proposal to be acceptable, the Proposed Mitigation Credits (PMC) must be equal to or greater than the Required Mitigation Credits (RMC). *In accordance with the federal goal of no net loss of aquatic resources, at least 25% of the required credits must be generated through non-preservation mitigation.* SCDHEC/OCRM master planned projects may be exempt from this requirement on a case-by-case basis as determined by SCDHEC and the Corps.

Proposed Mitigation Credits (PMC) ≥ Required Mitigation Credits (RMC)

And,

$$\mathbf{PMC_{non\text{-}preservation} \geq \frac{1}{4} \times RMC}$$

5.2. Buffer improvement Credits for Wetlands

(To be used in determining a net improvement score for buffering on the Proposed Wetland Mitigation Credit Worksheet.)

5.2.1. Buffer improvement

Buffers meeting the requirements specified below will qualify for improvement credit and generate a value to be used in the Proposed Wetland Mitigation Credit Table in section 5.3.3. In most cases, buffers will be required in association with wetland mitigation. SCDHEC/OCRM master planned projects may be exempt from this requirement on a case-by-case basis as determined by SCDHEC and the Corps. The following issues should be considered when evaluating buffers in terms of the overall quality and general acceptability.

- Both the buffer and the buffered aquatic area must be preserved through acceptable restrictive covenants or other approved protective measures (except in the case of publicly owned waters).
- Buffers may not be acceptable if their contribution to system integrity is of questionable value due to shape, condition, location, inadequate or excessive width, or other reasons.

- Wetland buffers receiving improvement credit must consist of uplands. (Stream buffers can include wetland areas.)
- 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 and slope. Buffers that do not meet the minimum width or mean width requirements will not be included in calculating credits.
- Buffers should be established adjacent to all protected and/or restored wetlands. Buffer improvement values will generally not be assigned to protected and/or restored wetlands that are not buffered in their entirety.
- Buffers that have recently been clearcut will generally not be considered for mitigation unless they have been replanted with a mix of native species that are favorable to site conditions.

5.3. Tables

5.3.1. Required Wetland Mitigation Credit Table

Wetland Required Mitigation Credit						
Factors	**Options**					
Lost Type	Type C 0.2		Type B 3.0		Type A 4.0	
Priority Category	Tertiary 0.5		Secondary 3.0		Primary 4.0	
Existing Condition	Very Impaired 0.1	Impaired 1.0		Partially Impaired 2.0		Fully Functional 3.0
Duration	Seasonal 0.1	0 to 1 0.2	1 to 3 0.5	3 to 5 1.0	5 to 10 1.5	Over 10 2.0
Dominant Impact	Shade 0.2	Clear 1.0	Dredge 2.0	Drain 3.0	Impound 4.0	Fill 5.0
Cumulative Impact	$0.05 \times \sum AA_i$					

Where ∑AAi stands for the sum of the acres of adverse impacts to aquatic areas for the overall project.

Note: The same cumulative impact factor for the overall project must be used for each area on the Required Wetland Mitigation Worksheet.

5.3.2. Required Wetland Mitigation Credit Worksheet

Wetland Required Mitigation						
	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Lost Type (Wetland)						
Priority Category						
Existing Condition						
Duration						
Dominant Impact						
Cumulative Impact						
Sum of r Factors (R)						
Impacted Area (Acres) (AA)						
Debit = R x AA=						
					Total RMC = ∑ (R x AA):	

5.3.3. Proposed Wetland Mitigation Credit Table

Wetland Mitigation Credit					
Factors	**Options**				
Net Improvement	N.A.* 0	Minimal Enhancement-----to---- Excellent Restoration 0.4 6.0			
Buffer	0.1 – 1.0 (See Section 14.2 for calculation)				
Priority Category	Tertiary 0.1	Secondary 0.2	Primary 0.3		
Existing Condition	N. A.** 0	Very Impaired 0	Impaired 0.1	Partially Impaired 0.4	Fully Functional 0.5
Control	N. A. 0	Covenant Private 0	Covenant POA 0.1	Conservation Easement 0.3	Transfer Fee Title Conservancy 0.4
Credit Schedule	Schedule 5* 0	Schedule 4 0.1	Schedule 3 0.2	Schedule 2 0.3	Schedule 1 0.4
Kind	Category 5 0	Category 4 0.05	Category 3 0.1	Category 2 0.2	Category 1 0.3
Location	Zone 5 0	Zone 4 0.05	Zone 3 0.1	Zone 2 0.2	Zone 1 0.3

Note: Preservation credit is generally limited to fully functional or partially impaired areas. Preservation credit will not be given to recently cleared wetlands.

* Use this option to calculate credits for preservation.

** Use this option to calculate credits for non-preservation

5.3.4. Proposed Wetland Mitigation Credit Worksheet

Wetland Mitigation Credit						
Factors	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Net Improvement						
Buffer						
Priority Category						
Existing Condition						
Control						
Credit Schedule						
Kind						
Location						
Sum of m Factors (M)						
Mitigation Area (Acres) (AA)						
M × A=						
Total Preservation/Restoration Credit = Σ (M x A):						

5.3.5. Wetland Mitigation Summary Worksheet

Wetland Mitigation Summary		
I. Required Mitigation		**Credits**
A.	**Required Wetland Credit (RWC):**	

II. Non-Banking Mitigation Credit Summary		**Acres**	**Credits**
B.	Non-preservation:		
C.	Preservation:		
D.	**Total Proposed Non-Bank Mitigation = B+C:**		

III. Banking Mitigation Credit Summary		**Acres**	**Credits**
E.	Non-preservation:		
F.	Preservation:		
G.	**Total Proposed Bank Mitigation = E+F:**		

IV. Grand Totals		**Acres**	**Credits**
H.	Total Non-preservation Mitigation ($Credit_{WR}$) = B+E:		
I.	Total Preservation Mitigation ($Credit_{WP}$) = C+F:		
J.	**Total Proposed Wetland Credit (PWC) = D+G:**		

V. Mitigation Checks	**Yes**	**No**
Is PWC ≥ RWC (Is "J" greater than "A")?		
Is $Credit_{WR}$ ≥ ¼ RWC (Is "H" greater than 25% of "A")?		

5.3.6. Definition of Factors in Wetland Tables

Lost Type (Wetland)

Categories are based on the suite of functions that they perform and are defined as follows.

Type A

- Tidal vegetated systems
- Riverine systems including headwaters and riparian zones
- Intertidal flats
- Shallow subtidal bottoms
- Bottomland hardwoods

Type B

- Seeps and bogs
- Savannahs and flatwoods
- Depressions
- Pocosins and bays

Type C

- Man-made lakes and ponds
- Vegetated lake littoral
- Impoundments
- Shallow cove areas

Other habitat types not categorized above 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.

Priority Category For Wetlands

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 that provide important contributions to biodiversity on an ecosystem scale, or that provide 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 inkind replacement in the same watershed.

Designated Primary Priority Areas include:

- National Estuarine Sanctuaries
- Wild and Scenic Rivers.
- Designated Shellfish Grounds
- Outstanding Resource Waters
- Essential Fish Habitat
- Waters that are impaired by a specific parameter(s) that results in a 303(d) listing.
- Trout waters
- Anadromous fish spawning waters
- Old growth climax communities that have unique habitat structural complexity likely to support rare communities of plants or animals
- National Wildlife Refuges

- All tidal waters
- State Heritage Trust Preserves
- Waters officially designated by State or Federal agencies as high priority areas

Also included in the primary priority category are the following rare aquatic systems:

- Hillside Herb Bog
- Upland Bog
- Atlantic White Cedar Bog
- Depression Meadow
- Piedmont Seepage Forest
- Limestone Sink
- Pine Savannah
- Interdune Pond

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

- Carolina Bay
- Bay Forest
- Salt Shrub Thicket
- Mature, native forest community with average tree age of 50 year +
- Swale Pocosin
- Pond Cypress Pond
- Seepage Pocosin
- Upland Depression Swamp Forest
- High Elevation Seep

Tertiary priority areas include the following categories of aquatic systems that do not fall into the designated primary priority category:

- Bald Cypress-Tupelo Gum Swamp
- Swamp Tupelo Pond
- Pocosin (other than seepage or swale)
- Non-alluvial Swamp Forest
- Pond Pine Woodland
- Pine flatwoods
- Bottomland hardwood

Note: descriptions of these community types may be found in Nelson, John B. "The Natural Communities of South Carolina, Initial Classification and Description".

Existing Condition

Existing condition pertains to the ability of the site to perform its physical, chemical, and biological functions. This factor evaluates site disturbances 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. Examples include pristine (undisturbed) wetlands, aquatic areas with non-functional ditches or old logging ruts with no effective drainage, minor selective cutting.

Partially impaired means that site disturbances have resulted in partial or full loss of one or more functions but functional recovery could be reversed through natural processes. Examples include: clear-cut wetlands, aquatic areas with ditches that impair but do not eliminate wetland hydrology, or temporarily cleared utility corridors.

Impaired means that site disturbances have resulted in major impairment of wetland functions where functional recovery is unlikely to occur naturally. Examples include: areas that have been drained and converted to pine monoculture, areas that are severely fragmented, or wetlands within maintained cleared utility corridors.

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

Duration

The length of time the adverse impacts are expected to last. *Seasonal duration* means that the adverse impacts are limited to times outside of applicable nesting, breeding, or growing periods.

Dominant Impact

Categories are defined as follows:

Clear means to remove vegetation without disturbing the existing topography of the soils.

Draining means ditching, channelization, 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 U. S. waters.

Fill means depositing material used for the primary purpose of replacing an aquatic area with dry land or of changing the bottom elevation of a water body.

Impound means to collect or confine the flow of a riverine system by means of a dike, dam, or other man made barrier. Impoundments may result in the formation of ponds, lakes, reservoirs, detention basins, etc., or, as in flood dikes, they may limit the reach of high waters.

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

Cumulative Impact

Cumulative impact is an evaluation of the cumulative adverse impacts to aquatic sites for the overall project. This factor is proportional to the amount of impact.

Wetlands: The formula used to calculate this value is $0.05 \times \sum AAi$ where $\sum$ AAi stands for the sum of the acres of adverse impacts to aquatic areas for the overall project. When computing this value, round to the nearest tenth decimal place.

Net Improvement for Wetland Systems (NI)

An evaluation of the net level of functional enhancement or restoration to an aquatic site associated with a proposed mitigation action. This factor is evaluated using a sliding scale, with values ranging from 0.4 for low-level enhancement to 6.0 for excellent restoration. Examples of NI are given in the following table. **These values are subject to variation based on specific site conditions.**

Net Improvement Action	Factor
Wetland creation (see Section 5.11)	0.4
Cattle exclusion from wetlands	0.5
Planting native species in clearcut wetlands	0.5
Invasive plant removal and/or management	0.7
Invasive species removal and planting native species	1.5
Increasing number and/or size of culverts in causeways to improve sheet flow	1.5
Ditch plugging to enhance natural hydrology (applicable only to area of influence)	2.0
Breaching causeways/dikes to improve sheet flow	2.0
Conversion of pine monoculture or agriculture lands to forested wetlands by clearing, site preparation and planting	3.0
Restoration of braided creek systems and natural sheet flows through causeway/road removal (applicable only to area of influence)	3.0
Conversion of pine monoculture or agriculture lands to forested wetlands by clearing, site preparation/planting plus restoring hydrology through surface water modifications such as plugging ditches	4.0
Fill removal, restoration of native wetland plant communities	5.0
Fill removal, restoration of native wetland plant communities, and restoring hydrology through surface water modifications such as plugging ditches	6.0

Buffer Improvement

The buffer improvement factor can range from 0.1 to 1 and is derived using factors such as the age of the forest, the amount of restoration, the slope and the land use adjacent to the buffer. The calculation for buffer improvement is done using the following equation:

$$\textit{Buffer Improvement} = ((\%\ \textit{preservation} \times PM) + (\%\ \textit{restoration} \times RM)) \times BWM$$

Also, where additional units are required within the buffer zone, add these units to the above equation. For example, if two distinctly different age preservation units occur adjacent to the same wetland, then the equation would be:

$$\textit{Buffer Improvement} = ((\%\ \textit{preservation} \times PM) + (\%\ \textit{preservation} \times PM) + (\%\ \textit{restoration} \times RM)) \times BWM$$

Note: The sum of %'s always equals 100% of the buffer area. (example: 30% + 20% + 50% = 100%)

Factors in the Equation are determined as follows:

PM = Preservation Multiplier

PM is a factor that evaluates the value of a buffer based on average tree age. This category is restricted to areas of buffer that are in native forest or will mature into native forest without active restoration.

Average Tree Age	Preservation Multiplier (PM)
< 5 years	0
5 –15 years	0.1
15-50 years	0.3
> 50 years	0.5

RM = Restoration Multiplier

RM is a factor that evaluates the quality of a buffer restoration plan. The two levels of buffer restoration are:

Good (0.3): Planting the appropriate native plant community **OR** invasive/exotic plant control

Excellent (0.45): Combination of planting the appropriate native plant community **AND** invasive/exotic plant control

BWM = Buffer Width Multiplier

BWM is a factor to determine the BWM you will first need to determine the Proposed Buffer Width (PBW) and the Minimum Mean Buffer Width (MWB). The value for the BWM can be taken from the following table. Credit determinations for ratios falling between the calculated values may be interpolated. For example, a 3:1 ratio would receive a 1.65 score.

Ratio of Proposed Buffer Width to Minimum Buffer Width: (PBW:MBW)	Buffer Width Multiplier (BWM)
1:1 (Adequate)	1.0
2:1 (Improved)	1.5
4:1 (Preferred)	1.8
6:1 (Discretionary Additional)	2.0

Where:

PBW = The mean buffer proposed by the applicant.

MBW = The minimum buffer required given the land use and the slope.
= (RBLU x SM)
RBLU = Required Buffer for each Land Use (See table below)
SM = Slope Multiplier (See table below)

Required Buffer for each Land Use For Wetlands* (RBLU)

Land Use	Min Mean Width (ft)**	Min Width (ft)**
Single Family Residential	25	15
Multi-Family Residential	40	15
Commercial / Golf Course / Agricultural	50	20
Industrial	75	50
Landfill	75	50
Other Categories	case-by-case	

* Assumes a slope of less than 5%. Slopes greater than 5% require a slope multiplier.
** Widths are based on linear, constant elevation measurement

SLOPE MULTIPLIER (SM)	
Percent Slope Perpendicular to Wetland	**Multiplier Factor**
Less than 5%	1x
5% - 20%	2x
21%-40%	3x
Greater than 40%	4x

Note: Credits may not be given for buffer widths deemed excessive to providing benefits to the aquatic system. In general, buffers that exceed 6 times the minimum buffer requirements will not be given additional buffer width credit. Wetlands that are impacted and lack functional values are not considered candidate wetlands for solely preservation credit.

Control

Control is the mechanism for enforcing land protection. Related terms are:

> *Conservancy* means transferring fee title to a qualified, experienced, non-profit conservation organization or government agency.
>
> *Easement* means a conservation easement granted to a qualified, experienced, non-profit conservation organization or government agency.
>
> *Covenant POA* means filing deed restrictions with oversight by a property owners association or other similar, formally chartered, non-profit organization.
>
> *Covenant Private* means filing deed restrictions by a private individual or business enterprise.

Credit Schedule (i.e. Timing)

Credit schedule refers to the relative time when the mitigation will be performed. *Mitigation schedules are reviewed and approved on a case-by-case basis.* Note well that, for projects other than mitigation banks, schedule 5 is unlikely to be approved. All credit withdrawals associated with mitigation banks must be able to meet interim success criteria commensurate with the level of credit withdrawal. Related terms include:

Schedule 1. For mitigation not involving banks it means that the mitigation is done prior to the adverse impacts. For Mitigation Banks this means that no credits may be withdrawn prior to final determination of success.

Schedule 2. For mitigation not involving banks it means the majority of the mitigation is done prior to the impacts and the remainder is done concurrent with or after the impacts. For Mitigation Banks this means that no more than 10% of the credits may be withdrawn prior to final determination of success.

Schedule 3. For non-banking mitigation it means the mitigation is concurrent with the impacts. For Mitigation Banks this means no more than 20% of the credits may be withdrawn prior to final determination of success.

Schedule 4. For mitigation not involving banks it means the majority of the mitigation is done concurrent with the impacts and the remainder is done after the impacts. For Mitigation Banks this means that no more than 30% of the credits may be withdrawn prior to final determination of success.

Schedule 5. Kind For mitigation not involving banks it means the mitigation is done after the impacts. For Mitigation Banks this means that more than 30% of the credits may be withdrawn prior to final determination of success.

A factor used to compare the relative functions and values of the mitigation site to the impacted site. For Mitigation Banks, specific kind categories are defined after an assessment of the banking proposal. For proposals not involving mitigation banks, kind categories are In-Kind and Out-of-Kind. Related terms include:

Category 1 is In-Kind for non-mitigation banks and is specially defined for mitigation banks. *In-kind Mitigation* means the replacement of the impacted aquatic site with one that has very similar morphological and biological features.

Category 2 is defined for each mitigation bank following an assessment of the bank.

Category 3 is defined for each mitigation bank following an assessment of the bank.

Category 4 is Out-of-Kind for non-mitigation banks and is specifically defined for mitigation banks. *Out-of-kind Mitigation* means the replacement of an impacted aquatic site with one that has different morphological and biological features.

Category 5 is defined for each mitigation bank following an assessment of the bank.

Location

A factor used to compare the relative location of the mitigation site to the impact site. **For Mitigation Banks, Zones will be defined for the bank after an assessment of the banking proposal.** For mitigation proposals not involving mitigation banks, location categories are as shown below. Note: mitigation outside the impacted wetland's ecoregion will generally not be acceptable. Related terms include:

Zone 1 Onsite. *Onsite* means within or adjacent to the project boundaries and within the impacted watershed.

Zone 2 Inside. *Inside* means within the impacted watershed but offsite.

Zone 3 is defined for mitigation banks only.

Zone 4 Outside. *Outside* means outside of the impacted watershed but within the same ecoregion.

Zone 5 is defined for mitigation banks only.

Mitigation for Linear Systems (Streams)

6.1. General Guidance

The guidance for compensatory mitigation for linear systems is sufficiently different from that developed for wetlands to warrant a separate section. However, the majority of guidance contained in the General Information section, if not expressly overridden by guidance contained in this section, applies to compensatory mitigation for stream systems.

Compensatory mitigation for linear aquatic systems (streams) will require some form of stream restoration or enhancement action. Activities that constitute restoration include, but are not limited to: stream channel restoration; bank stabilization; in stream habitat recovery; impoundment removal; livestock exclusion devices; road crossing improvements; and natural buffer establishment. **A minimum of 25% of needed credits must be generated by restoration activities other than buffer improvement .** All of these restoration measures should be designed with the goal of improving habitat, biological integrity, stream stability and water quality. Methods for stream restoration are described in detail in Rosgen 1996, The Federal Stream Restoration Working Group 1998, and United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) 1996 (see references under Item 3.6). Information on stream classification, restoration, regional curves and the following fact sheets are available online at the website for the North Carolina Stream Restoration Institute of North Carolina State University: http://www5.bae.ncsu.edu/programs/extension/wqg/sri/.

Fact Sheet #1	Natural Stream Processes
Fact Sheet #2	Application of the Rosgen Stream Classification System to North Carolina
Fact Sheet #3	Finding Bankfull Stage in North Carolina Streams
Fact Sheet #4	Using Root wads and Rock Vanes for Stream bank Stabilization

Also, a manual on field techniques for stream measurements entitled "Stream Channel Reference Sites: An Illustrated Guide to Field Technique" may be downloaded from the Forest Service website: http://www.stream.fs.fed.us.

6.2. Stream Channel Restoration

Stream channel restoration involves actions taken to correct previous alterations that have impaired the character and function of stream systems. Restoration is the process of converting an unstable, altered, or degraded stream corridor to its natural or referenced stable condition, considering recent and future watershed conditions. This process may include restoration of the stream's geomorphic dimension, pattern and profile and/or biological and chemical integrity, including transport of water and sediment produced by the streams' watershed in order to achieve dynamic equilibrium.

Stream stability is morphologically defined as the ability of the stream to maintain, over time, its dimension, pattern, and profile in such a manner that it is neither aggrading nor degrading and is able to transport without adverse consequence the flows and detritus of its watershed (Rosgen 1996). A number of factors can change the stability and function of streams including changes in stream flow, sediment regime, land use within the watershed, and direct disturbances (e.g., channelization, culverts, bridges and loss of bank stabilizing riparian vegetation) (Rosgen, 1996). Restoration of natural stream stability requires careful study by experts trained in stream geomorphology. It may involve changing channel width, bank stabilization measures, flow modification, grade control, stream routing changes to improve sinuosity and/or other measures to appropriately handle stream energy and reconnect the stream with its floodplain. In other words, it may entail basic changes in the stream's dimension, pattern and profile, consistent with stream type and valley slope, to re-establish stability. Reference reach data from a stream(s) of the same target stream type (Rosgen, 1996) (see Appendix) and from the same ecoregion should serve as a template for the design of the restoration stream's dimension, pattern, profile, bed material and erosional processes. It is important to develop restoration plans in consultation with appropriate resource and regulatory agencies.

For those situations where major restoration of appropriate stream dimension, pattern and profile are warranted, credits will reflect the following priority system:

Priority 1 Restoration. Building a new morphologically stable channel at a higher elevation thereby connecting to the original floodplain. In the Southeast Piedmont, the new channels will typically be Rosgen type C or E channels.

Priority 2 Restoration. Restoring morphological stability to an existing channel and reestablishing a floodplain at the current elevation or higher to create a Rosgen type C or E stream. This priority restoration is used when relocation of an incised stream is not feasible.

Priority 3 Restoration. Where relocation of an incised stream is not practicable and modifying the existing channel to create a stable Rosgen type C or E stream channel is impracticable due to belt width constraints (limited land width available to form the meanders necessary for C or E stream types), modifying the existing channel and floodplain at its current elevation to create a stable Rosgen type B or Bc (low slope B) channel. This converts the stream to a new stream type at the existing elevation of the channel but without an active floodplain.

Priority 4 Restoration. Hardening or stabilizing the existing channel in place. This is the least desirable from a biological and aesthetic standpoint and often the most costly. It should only be used when there are insurmountable constraints to using other restoration solutions, as may be the case in some urban settings. Some activities undertaken under Priority 4 Restoration are not suitable for mitigation purposes and may be considered adverse impacts that require compensatory mitigation.

Protection of the restored stream and an acceptable buffer (see Item 6.9) through appropriate mechanisms (restrictive covenants, conservation easements or transfer in fee title to a conservation entity) is required to obtain stream channel restoration credits. Buffers wider than the minimum allowable may receive additional credits based on the tables in section 6.12.6, Buffer Improvement Factor. In unusual circumstances, where the minimum buffer width may not be met for a portion of the restored stream area, the maximum-forested width possible will be protected and the buffer factor will be adjusted accordingly.

6.3. Stream Channel Relocation

Certain stream relocation projects can be credited through use of the Stream Mitigation Credit Table (see Item 6.12.3). Channel relocation refers to moving a stream to a new location to allow a project to be constructed in the stream's former location. To qualify for mitigation credit, relocated streams should be designed using natural channel techniques whereby the dimension, pattern and profile reflect referenced stable conditions. In addition, relocated streams must have at least a 50' native forested buffer from each bank. Preservation of the relocated stream and buffers through appropriate mechanisms (restrictive covenants, conservation easements or transfer in fee title to a conservation entity) is required to obtain stream mitigation credits.

Most properly designed stream relocations will be credited within the range of a "Good" Net Improvement Factor. Relocating streams outside the existing floodplain is generally discouraged, however, in cases were it is approved will be credited within the range of a "Moderate" Net Improvement Factor. No mitigation credit is generated for relocated streams that do not meet the above criteria or those which are primarily rip-rapped, constructed with concrete, or serve primarily as stormwater conduits.

6.4. Bank Stabilization

Bank stability depends largely on bank height, bank angle, and soil conditions. Bank stabilization can be accomplished using a number of different techniques. For direct bank placement, bioengineering techniques utilizing natural materials (e.g., root wads), and vegetative cover are preferred over those requiring surface hardening such as placement of stone, concrete or other materials. Indirect methods can be as effective as direct bank placement methods with the best results coming from using a combination of both. Indirect methods include instream structures such as "J-hook" vanes to reduce energy at the bank interface. It is important to note that just "patching" banks along an unstable channel may only be a short-term fix to a more complex problem and will garner little credit. In addition, stabilization on only one side of a stream that results in bank erosion on the opposite side is not acceptable as mitigation.

6.5. Instream Habitat Recovery

Instream habitat recovery is controlled by factors such as stream flow, channel structure, cover, water quality and riparian corridors. Generally, to improve instream habitat, structures such as cross vanes, floating log covers, bed load traps, bank covers and fish passage structures are used. Note that man-made structures are less sustainable and rarely as effective as a stable channel, therefore, project designs should be made to mimic

natural conditions. Often, stable stream channels provide adequate habitat and caution is needed to ensure that fish habitat structures do not result in upsetting stream stability. Instream structure proposals shall require a full morphological analysis to ensure that they do not alter the appropriate dimension, pattern, and profile for the stream type. Also, differing stream types may be incompatible with certain habitat structures (Rosgen, 1996). Where such man-made structures are deemed beneficial, periodic maintenance may be necessary and if so should be incorporated into project plans.

6.6. Impoundment Removal

Dam removal is another acceptable form of stream restoration. Dams adversely affect and fragment stream systems by altering stream flows and sediment transport thereby, creating physical alterations in both tailwaters and downstream riparian zones. Dams also disrupt the movement of aquatic organisms, organic matter, and nutrients thereby, creating biological effects both upstream and downstream. Dam removal, if done properly, can restore a stream to its natural condition. On streams with no downstream impoundments, considerable functional improvements can be obtained. However, without sufficient studies and modeling, dam removal can result in bed and bank instability and increased sediment loads. These impacts will occur until the stream reaches a state of dynamic equilibrium. Important elements to consider when doing dam removal include restoring fish passage, revegetating the reservoir area, and long term monitoring of sediment transfer, water quality, stream channel morphology and aquatic ecology.

6.7. Livestock Exclusion

By restricting livestock from stream access, bank degradation, sedimentation and water quality problems can be reduced. For streams impacted by livestock activities, corrective measures to ensure elimination of the impact and stream recovery will be credited. Actions which may receive mitigation credit include: fencing stream corridors, designing controlled livestock access points with stable and protected stream banks, and/or totally eliminating access and providing drinking water from tanks, troughs or other structures.

Credits within the "Moderate" range of the Net Improvement Factor will be determined by the current degree of stream impact and the extent of the corrective actions. Measures credited for mitigation purposes must be protected through appropriate mechanisms (restrictive covenants, conservation easements or transfer in fee title to a conservation entity).

6.8. Hydrologic Improvements at Road Crossing

Hydrologic improvements at road crossing can provide stream enhancements by preventing downstream scour and upstream ponding; and by connecting natural floodplains. Measures considered improvements include, but are not limited to, replacement of culverts with bridging, floodplain culverts, and resetting or resizing culverts to allow fish passage and other stream processes.

6.9. Establishment of Natural Buffers

It is recognized that forested riparian zones are essential to stream system function, channel stability and maintenance of water quality and instream habitat. Natural buffers

provide functions such as runoff filtration, stream shade, wildlife corridors, and contribution of woody debris and detritus. Streams typically require more buffer protection than wetlands, therefore buffer widths of 50 feet or greater (depending on slope) are required to get buffer credit. In addition, all buffers and their associated streams and banks must be protected in perpetuity through restrictive covenants, conservation easements or transfer in fee title to a conservation entity.

Increased mitigation credit may be obtained by enhancing buffers. Buffer improvement can be accomplished with active reforestation of native species and/or removal of exotics. **Note that streams that are recognizably unstable and that require significant channel or bank restoration are not considered candidate streams for non-restoration credit regardless of the level of buffer enhancement.** In cases where you have stream confluences with both being buffered, buffer credit will only be counted for one of the two streams. The other stream will be given preservation credit without buffer improvement.

6.10. Other Enhancement.

The Corps, in consultation with other MBRT resource and regulatory agencies, will determine, on a case-by-case basis, the net benefit of mitigation actions that do not involve direct manipulation of a stream and/or its riparian buffers. These may include watershed protection practices that provide functions above and beyond the normal stormwater permit requirements. Retrofitting stormwater detention facilities with low impact development features such as aquatic gardens and construction of off channel facilities in areas where runoff is accelerating stream bank erosion are two examples.

6.11. Stream Mitigation Equation

When compensatory mitigation is required, the mitigation plan will be evaluated using the mitigation factors tables. These calculation tables are not intended to represent an exact or statistically proven scientific method. Rather, the method is based on the judgment of regulatory and resource agency staff. It is intended to establish a clear, understandable, and consistent method for use by applicants and regulators. As additional experience with this procedure is gained, it is possible that the tables of factors will be reviewed and adjusted. Always use the most recent approved edition of the tables.

Simply stated, for a mitigation proposal to be acceptable, the Proposed Mitigation Credits (PMC) must be equal to or greater than the Required Mitigation Credits (RMC). *In accordance with the federal goal of no net loss of aquatic resources, the portion of the PMC resulting from stream restoration must be at least 25% of the RMC.* The mitigation credits for RMC and PMC are calculated using the options and factors given in Item 6.12.

$$\textit{Proposed Mitigation Credits (PMC)} \geq \textit{Required Mitigation Credits (RMC)}$$
$$\textit{And}$$
$$\textit{PMC Stream Restoration} \geq \tfrac{1}{4} \textit{ RMC}$$

Each category of mitigation (stream restoration or preservation) is calculated using the table of factors to compute the credit multipliers for each unique mitigation area. Sample worksheets are provided for documenting and comparing the calculated PMC and the RMC.

6.12. Tables

6.12.1. Stream Required Mitigation Credit Table

Stream Required Mitigation Credit									
Factors	**Options**								
Lost Type	Intermittent 1st and 2nd Order Streams 1.0						All Other Streams 4.0		
Priority Category	Tertiary 0.5			Secondary 3.0			Primary 5.0		
Existing Condition	Impaired..... 0.1			Partially Impaired..... 1.5			Fully Functional 3.0		
Duration	Seasonal 0.2			0-1 Year 0.5			> 1 Year 3.0		
Dominant Impact	Shade/ Clear 0.1	Utility Crossing 0.3	Culvert 0.6	Armor 1.0	Detention /Weir 1.5	Morph-ologic 3.0	Impound 4.0	Pipe 4.2	Fill 5.0
Cumulative Impact	0.0005 x total linear feet of stream impacted ($\sum LL_i$)								

Note: The cumulative impact factor for the overall project must be used for each area on the Stream Mitigation Debit Worksheet.

6.12.2. Stream Required Mitigation Credit Worksheet

Linear Mitigation Credit Required						
	Reach 1	Reach 2	Reach 3	Reach 4	Reach 5	Reach 6
Lost Type						
Priority Category						
Existing Condition						
Duration						
Dominant Impact						
Cumulative Impact						
Sum of R Factors (R)						
Linear Feet Impact (LL)						
R X LL=						
					Total Debit = $\sum$ (R X LL):	

6.12.3. Stream Mitigation Credit Table

Linear Credit					
Factors	**Options**				
Net Improvement	NA * 0	Moderate 0.7 – 2.0	Good 2.1 – 5.0	Excellent 5.1 – 7.0	
Buffer improvement	Calculate Value from the Net Improvement for Riparian Buffers Table (0.1 – 1.0 for each side of stream)				
Priority Category	Tertiary 0.05	Secondary 0.2	Primary 0.3		
Existing Condition	Impaired ** 0	Partially Impaired 0.1	Fully Functional 0.2		
Control	Covenant Private 0.05	Covenant POA 0.1	Easement 0.15	Conservancy 0.2	
Credit Schedule	Schedule 5* 0	Schedule 4 0.05	Schedule 3 0.1	Schedule 2 0.15	Schedule 1 0.2
Kind	Category 5 0	Category 4 0.02	Category 3 0.08	Category 2 0.15	Category 1 0.2
Location	Zone 5 0	Zone 4 0.05	Zone 3 0.10	Zone 2 0.15	Zone 1 0.2

* Use this factor for preservation; ** Use this factor for non-preservation.

6.12.4. Stream Mitigation Credit Worksheet

Linear Credit						
	Reach 1	Reach 2	Reach 3	Reach 4	Reach 5	Reach 6
Net Improvement						
Buffer improvement (Side A)						
Buffer improvement (Side B)						
Priority Category						
Existing Condition						
Control						
Credit Schedule						
Kind						
Location						
Sum of Factors (M)						
Linear Feet (L)						
M x L						
Total Preservation/Restoration Credit = Σ (M x L):						

6.12.5. Stream Mitigation Summary Worksheet

Stream Mitigation Summary		
I. Required Mitigation		**Credits**
A.	**Required Stream Credit (RSC):**	

II. Non-Banking Mitigation Credit Summary		**Linear Feet**	**Credits**
B.	Stream Restoration:		
C.	Preservation:		
D.	**Total Proposed Non-Bank Mitigation = B+C:**		

III. Banking Mitigation Credit Summary		**Linear Feet**	**Credits**
E.	Stream Restoration:		
F.	Preservation:		
G.	**Total Proposed Bank Mitigation = E+F:**		

IV. Grand Totals		**Linear Feet**	**Credits**
H.	Total Restoration Mitigation ($Credit_{SR}$) = B+E:		
I.	Total Stream Preservation Mitigation ($Credit_{SP}$) = C+F:		
J.	**Total Proposed Stream Credit (PSC) = D+G:**		

V. Mitigation Checks	**Yes**	**No**
Is PSC $\geq$ RSC (Is "J" greater than "A")?		
Is $Credit_{SR}$ $\geq$ ¼ RSC (Is "I" greater than 25% of "A")?		

6.12.6. Definition of Factors in Linear Tables

Lost Type

Categories are based on the suite of functions that they perform and are defined as follows:

First and Second Order Intermittent Streams: streams that generally have a defined natural watercourse that do not flow year round, but beyond periods of rainfall and are located upstream of the confluence of two second order streams.

All Other Streams: Means all streams other than First and Second Order Intermittent Streams.

Priority Category for Linear Systems

Designated areas of linear 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 watersheds.

Primary Priority: These areas provide important contributions to biodiversity on an ecosystem scale or high levels of function contributing to landscape or human values. Impacts to these areas should be rigorously avoided or minimized. Compensation for impacts in these areas should emphasize replacement nearby and in the same immediate 8-digit watershed. Designated primary Priority Categories include:

- SCDNR reference streams
- State Heritage Trust Preserves
- Wild and Scenic Rivers
- Anadromous fish spawning habitat
- Outstanding Resource Waters
- Essential Fish Habitat
- State Trout Natural streams
- Waters adjacent to Federal or State protected areas
- Stream reaches that are impaired by a specific parameter(s) that results in a 303(d) listing.
- Waters officially designated by State or Federal agencies as high priority, rare, vulnerable, or imperiled areas
- Waters with Federal or State listed threatened or endangered species

Secondary Priority: Secondary Priority Categories include:

- Waters with Federal Species of Management Concern or State listed rare or uncommon species
- State Trout Put, Grow and Take streams
- Stream and river reaches within 0.5 miles upstream or downstream of primary priority reaches
- Stream or river reaches in areas with potential for high growth that are not ranked as primary priority systems

- State Scenic River Corridors

Tertiary Priority: These areas include all other streams.

Existing Condition

A sliding scale ranging from 0.1 to 3.0, reflecting the functional state of a stream before any pre-project impacts. This is a measure of the stream's natural stability and resilience relative to the physical, chemical and biological integrity of the system.

Fully functional means that the geomorphology of a stream reach is stable and is representative of the stream type found in a similar topographical setting with similar watershed characteristics. The biological community is diverse with little impairment from anthropogenic inputs. For purposes of this SOP, a fully functional stream is one that is characterized by all of the following:

1) The stream has not been channelized; has no culverts, pipes, impoundments, or other instream manmade structures within 0.5 miles upstream or downstream.
2) The stream has an appropriate entrenchment ratio and width/depth ratio based on reference reach data for its stream type.
3) The stream shows little evidence of human-induced sedimentation.
4) The stream has a riparian buffer of deep-rooted vegetation (>50').

Partially Impaired means that stream integrity has been compromised through partial loss of one or more functions (chemical, physical, biological). For purposes of this SOP, a stream is considered partially impaired if any or all of the following characterizes it:

1) The entrenchment ratio and/or width/depth ratio indicates the channel is actively aggrading or degrading.
2) Human-induced sedimentation is moderate.
3) Only a limited riparian buffer of deep-rooted vegetation is present (minimum of 25 feet).
4) Culverts, pipes, impoundments, or other instream manmade structures occur within 0.5 miles upstream or downstream.

Impaired means that a stream has had a significant loss of system stability and resilience. Recovery is unlikely to occur naturally. For purposes of this SOP, a stream is considered impaired if any or all of the following characterizes it:

1) The reach has been channelized.
2) The reach has extensive human-induced sedimentation.
3) The reach has little or no riparian buffer with deep-rooted vegetation (<25').

4) The entrenchment ratio and/or width/depth ratio indicates the stream has degraded to a less desirable type (e.g., Rosgen type "G" or "F").

5) Culverts, pipes, impoundments, or other instream manmade structures occur within 0.1 mile upstream or downstream.

Duration

The length of time the adverse impacts are expected to last.

Seasonal duration means that the adverse impacts are limited to times outside of applicable nesting, breeding, or growing periods.

0 -1 year means impacts will occur within a period of up to one year and recovery of most system integrity will follow the cessation of permitted activity.

Greater than 1 year means project impacts will occur for greater than one year and often be permanent for most types of construction activities.

Dominant Impact

Categories are defined as follows:

Armor refers to riprap, bulkhead, or use other rigid methods to contain stream channels.

Pipe refers to routing or diverting a stream through a pipe, culvert, or other enclosed structure for a distance greater than 150 feet.

Clearing refers to activities, such as clearing streambank vegetation without disturbing the existing topography or soil stratigraphy.

Culvert refers to routing a stream through pipes, box culverts, or other enclosed structures for a distance less than 150 feet. Culverts should be designed to allow unimpeded natural stream processes such as sediment transport and fish migration. Culverts on streams with active floodplains should be designed to pass flows in the floodplain. Improperly designed culverts will be assigned a higher Dominant Impact Factor. Culvert extensions where the cumulative length of the existing culvert and the additional extension exceeds 150 feet will be considered "piping".

Detention refers to placing a weir in a stream to slow or to divert water when bankfull is reached. The structure should be designed to allow ingress and egress of aquatic organisms and to pass flows below bankfull stage.

Fill refers to the permanent fill of a stream channel.

Impound means to dam a stream or otherwise convert it to a lentic state. Installation of a dam that modifies the stream to facilitate sediment control and/or stormwater management is considered impoundment.

Morphologic means to channelize, dredge, or otherwise alter the established or natural dimension, pattern, or profile of a stream.

Utility crossings refer to open cut construction or other pipeline/utility line installation methods that require disturbance of the streambed and that require reestablishment of pre-project contours after installation.

Shading refers to intercepting or blocking sunlight. Examples of projects causing shading impacts include bridges, piers, and buildings on pilings.

Cumulative Impact

Cumulative impact is the evaluation of the cumulative adverse impacts to aquatic sites for the overall project. This factor is proportional to the amount of impact. For streams, the cumulative impact factor is calculated by multiplying the total linear feet of stream impacted by the project times a factor of 0.0005.

Net Improvement for Stream Restoration

A measure of restored channel stability. Stable streams reflect proper morphology relative to the physical watershed characteristics and relate directly to stream functions. This factor is evaluated using a sliding scale, with values ranging from 0.7 for low-level enhancement to 7.0 for excellent restoration. Examples of NI are given in the following table. **These values are subject to variation based on specific site conditions.**

Net Improvement Action	Factor
Stream Relocations outside of the existing floodplain.	0.7
Cattle exclusion	1.0
Replacing inappropriately sized/designed culverts or placing floodplain culverts at existing road crossings to allow more natural flood flows	1.7
Good quality "Priority 4" stream restoration	2.0
Restoring stream bank stability using non-rigid methods in highly eroded areas	2.5
Restoring natural channel features (i.e., riffle/run/pool/glide habitat) using morphology appropriate to target stream type.	3.0
Good quality "Priority 3" stream restoration	3.5
Stream Relocations within the existing floodplain	4.0
Good quality "Priority 2" stream restoration	4.5
Routing a stream around an existing impoundment by creating a morphologically stable and appropriate stream channel.	5.0
Excellent quality "Priority 2" stream restoration	5.2
Removing impoundment dams and re-establishing natural stream channel (this factor could increase or decrease based on the presence or absence of other impoundments in the immediate watershed)	6.0
"Priority 1" stream restoration	7.0
Constructing fish ladders where appropriate	Case by case

Buffer Improvement

The buffer improvement factor can range from 0.1 to 1 and is derived using factors such as the age of the forest, the amount of restoration, the slope and the land use adjacent to the buffer. The calculation for buffer improvement is done using the following equation:

Buffer Improvement = ((% preservation x *PM) + (% restoration* x *RM)) x SBM x BWM*

Also, where additional units (preservation or restoration) are required within the buffer zone, add these units to the above equation. For example, if two distinctly different age preservation units occur adjacent to the same stream, then the equation would be:

Buffer Improvement = ((% preservation x *PM) + (% preservation* x *PM) + (% restoration* x *RM)) x SBM* x *BWM*

Note: The sum of %'s always equals 100% of the buffer area. (example: 30% + 20% + 50% = 100%)

Factors in the Equation are determined as follows:

PM = Preservation Multiplier

PM is a factor that evaluates the value of a buffer based on average tree age. This category is restricted to areas of buffer that are in native forest or will mature into native forest without active restoration.

Average Tree Age	Preservation Multiplier (PM)
< 5 years	0
5 –15 years	0.1
15-50 years	0.3
> 50 years	0.5

RM = Restoration Multiplier

RM is a factor that evaluates the quality of a buffer restoration plan. The two levels of buffer restoration are:

Good (0.3): Planting the appropriate native plant community **OR** invasive/exotic plant control

Excellent (0.45): Combination of planting the appropriate native plant community **AND** invasive/exotic plant control

SBM = Stream Bank Multiplier

SBM is a factor that evaluates the difference between having buffers on one side or both sides of a stream. In cases where only a single side of a reach is buffered, a reach multiplier of 0.5 is used. In cases where both sides of a reach are buffered, a reach multiplier of 1.0 is used. In cases where one side is being buffered and the other side is already protected by easements or conservancy, then a reach multiplier of 1.0 is used.

BWM = Buffer Width Multiplier

The value for the BWM can be taken from the following table. To determine the BWM you will first need to determine the Proposed Buffer Width (PBW) and the Minimum Buffer Width (MBW).

Credit determinations for ratios falling between the calculated values may be interpolated. For example, a 3:1 ratio would receive a 1.65 score.

Ratio of Proposed Buffer Width to Minimum Buffer Width: (PBW:MBW)	Buffer Width Multiplier (BWM)
1:1 (Adequate)	1.0
2:1 (Improved)	1.5
4:1 (Preferred)	1.8
6:1 (Discretionary Additional)	2.0

Where: **PBW** = The mean buffer proposed by the applicant.
MBW = The minimum buffer required given the land use and the slope.
= (RBLU x SM)
RBLU = Required Buffer for each Land Use
SM = Slope Multiplier

Required Buffer for each Land Use For Wetlands* (RBLU)	
Land Use	Min Width (ft)**
Single Family Residential	50
Multi-Family Residential	60
Commercial / Golf Course / Agricultural	75
Industrial	100
Landfill	100
Other Categories	case-by-case
* Assumes a slope of less than 5%. Slopes greater than 5% require a slope multiplier. ** Widths are based on linear, constant elevation measurement	

SLOPE MULTIPLIER (SM)	
Percent Slope Perpendicular to Wetland	**Multiplier Factor**
Less than 5%	1x
5% - 20%	2x
21%-40%	3x
Greater than 40%	4x

Note: **Credit may not be given for buffer widths deemed excessive to providing benefits to the aquatic system. In general, buffers that exceed 6 times the minimum buffer requirements will not be given additional buffer width credit. Buffers that are impacted and lack functional values must be restored to provide credit. Buffering both sides of the**

stream is beneficial and generally required. Streams that are unstable and require significant channel or bank restoration are not considered candidate streams for solely buffer improvement credit. Furthermore, to be eligible for credits, perpetual protection of restored and/or intact, naturally forested riparian zones through restrictive covenants, conservation easements or transfer in fee title to a conservation entity is required.

Control

The mechanism for enforcing land protection. Related terms are:

> *Conservancy* means transferring fee title to a qualified, experienced, non-profit conservation organization or government agency.
>
> *Easement* means a conservation easement granted to a qualified, experienced, non-profit conservation organization or government agency.
>
> *Covenant POA* means filing deed restrictions with oversight by a property owners association or other similar, formally chartered, non-profit organization.
>
> *Covenant Private* means filing deed restrictions by a private individual or business enterprise.

Credit Schedule (i.e. Timing)

The relative time when the mitigation will be performed. Note well that, for projects other than mitigation banks, schedule 5 is unlikely to be approved. All credit withdrawals associated with mitigation banks must be able to meet interim success criteria commensurate with the level of credit withdrawal. Related terms include:

> *Schedule 1.* For mitigation not involving banks it means that the mitigation is done prior to the adverse impacts. For Mitigation Banks this means that no credits may be withdrawn prior to final determination of success.
>
> *Schedule 2.* For mitigation not involving banks it means the majority of the mitigation is done prior to the impacts and the remainder is done concurrent with or after the impacts. For Mitigation Banks this means that no more than 10% of the credits may be withdrawn prior to final determination of success.
>
> *Schedule 3.* For non-banking mitigation it means the mitigation is concurrent with the impacts. For Mitigation Banks this means no more than 20% of the credits may be withdrawn prior to final determination of success.
>
> *Schedule 4.* For mitigation not involving banks it means the majority of the mitigation is done concurrent with the impacts and the remainder is done after the impacts. For Mitigation Banks this means that no more than 30% of the credits may be withdrawn prior to final determination of success.
>
> *Schedule 5.* For mitigation not involving banks it means the mitigation is done after the impacts. For Mitigation Banks this means that more than 30% of the credits may be withdrawn prior to final determination of success.

Kind

A factor used to compare the relative functions and values of the mitigation site to the impacted site. With respect to streams, kind refers to stream order. **For Mitigation Banks, specific kind categories are defined after an assessment of the banking proposal.** For proposals not involving mitigation banks, kind categories are In-Kind and Out-of-Kind. Related terms include:

> *Category 1* is In-Kind for non-mitigation banks. *In-kind Mitigation* means the lost functions of the impacted stream will be mitigated through restoration or preservation of a stream of the same general order.
>
> *Category 2* is defined for each mitigation bank.
>
> *Category 3* is defined for each mitigation bank.
>
> *Category 4* is Out-of-Kind for non-mitigation banks. *Out-of-kind Mitigation* means the lost functions of the impacted stream will be mitigated through restoration or preservation of a stream of a different order.
>
> *Category 5* is defined for each mitigation bank.

Note: plans to mitigate lost stream function at a stream of greater than 2 stream orders of difference from the impacted site will generally not be acceptable.

Location

A factor used to compare the relative location of the mitigation site to the impact site. **For Mitigation Banks, Zones will be specifically defined after an assessment of the banking proposal.** For mitigation proposals not involving mitigation banks, location categories are as shown below. Related terms include:

> *Zone 1:* On-Site (½ mile up or downstream of the impact).
>
> *Zone 2: Off-Site (*greater than ½ mile from the impact site, and within the USGS 8-digit HUC watershed).
>
> *Zone 3:* Defined for each mitigation bank.
>
> *Zone 4:* Outside the impacted watershed but within the same ecoregion.
>
> *Zone 5:* Defined for each mitigation bank.

Note: in general, mitigation outside the impacted stream's ecoregion will not be acceptable.

7. Glossary

The acronyms, abbreviations, and terms used in this document are in accordance with the definitions given in the ACE's SOP titled *Terminology and Definitions*. For the purposes of this SOP, certain additional terms are defined in the attachments and as follows:

Adverse effects: Any adverse ecological effect on Waters of the United States including all filling, excavating, flooding, draining, clearing, or similar changes impacting U. S. Waters. This SOP does not address other categories of effects such as aesthetic, cultural, historic, health, etc.

Aquatic site: Any Water of the United States, including special aquatic sites (Wetlands, mud flats, vegetated shallows, coral reefs, riffle and pool complexes, sanctuaries, and refuges as defined at 40 CFR 230.40 thru 230.45.) such as wetlands.

Bankfull Discharge: The flow that is most effective at moving sediment, forming or removing bars, forming or changing bends and meanders, and doing work that results in the average morphologic characteristics of channels (Dunne and Leopold 1978). The bankfull stage is the point at which water begins to overflow onto a floodplain in naturally stable streams. Bankfull will not be at the top of the stream bank in incised or entrenched streams.

Bankfull Width: The width of the stream channel at bankfull measured in a riffle section.

Braided stream system: A stream system with multiple-thread channels, low stream gradient (< 0.005) and individual channels with highly variable bankfull width. These streams have extensive, well-vegetated floodplains and associated wetlands (Rosgen, 1996).

Buffer zone: As used in this SOP it refers to a defined area intended to separate, protect, and maintain certain functions of an aquatic system from upland development or other adverse effects.

Channel Features: Found in natural streams channel features refer to sequences of riffles and pools or steps and pools that maintain channel slope and stability and provide diverse aquatic habitat.

> *Riffles* are bed features with gravel or larger size particles where the water depth is relatively shallow and the slope is steeper than the average slope of the channel. At low flows, water moves faster over riffles, which provides oxygen to the stream. Riffles are found entering and exiting meanders and control the streambed elevation.
>
> *Pools* are located on the outside bends of meanders between riffles. The pool has a flat slope and is much deeper than the average depth of the stream.

Steps are vertical drops often formed by large boulders or downed trees. Deep pools are found at the bottom of each step. Step/pool sequences are found in higher gradient streams.

Compensatory mitigation: Compensating for adverse effects by replacing or providing substitute resources or environments. Categories of compensatory mitigation for ecological effects include creation, restoration, enhancement, and preservation. Compensatory Mitigation for aquatic areas addressed by this SOP include:

Creation means the conversion of non-aquatic habitat to aquatic habitat. Wetland creation usually includes grading, providing a suitable substrate, hydrology, and establishment of appropriate vegetation. Stream creation usually involves building a stream channel outside the existing alluvial floodplain.

Enhancement means increasing or improving one or more of the functions or values of an existing aquatic area.

Preservation means the conservation of an area to prevent its destruction or degradation.

Restoration means actions taken to correct previous alterations that have either destroyed or seriously impaired the character and functions of an aquatic area. An example is hydrological restoration followed by planting of appropriate wetland vegetation in a bottomland hardwood area that had previously been converted to a non-aquatic site.

Effect: The Council on Environmental Quality (CEQ) has stated at 40 CFR Part 1508.8 that the words *impacts* and *effects* are synonymous and that *effects* includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Further, the CEQ stated that *effects* include:

Direct effects are caused by the action and occur at the same time and place.

Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

Cumulative effects result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.

Note: this SOP is limited to evaluation of compensatory mitigation plans for adverse ecological effects. Mitigation for other categories of effects (e.g., historic, cultural, aesthetic) is not addressed.

Entrenchment Ratio: An index value used to describe the degree of vertical containment of a river channel. It is the ratio of the width of the flood-prone area divided by bankfull width.

Ephemeral streams: Streams that flow only in direct response to rainfall or snowmelt and in which discrete periods of flow persist no more than 29 consecutive days per event.

Flood-prone Area Width: The width of the flood-prone area as measured in the field at an elevation twice-maximum depth at bankfull. Maximum depth is the difference between the bankfull stage and thalweg elevations in a riffle section.

Intermittent streams: Streams that generally have defined natural watercourses that do not flow year around, but beyond periods of rainfall and with greater frequency than similarly located ephemeral streams.

MBRT: Mitigation Bank Review Team. An interagency group designated to review and consult with proponents regarding Compensatory Mitigation Bank proposals.

Mitigate: The Council on Environmental Quality has stated at 40 CFR Part 1508.20 that mitigation includes:

> *Avoiding* the impact altogether by not taking a certain action or parts of an action.
>
> *Minimizing* impacts by limiting the degree or magnitude of the action and its implementation.
>
> *Rectifying* the impact by repairing, rehabilitating, or restoring the effected environment.
>
> *Reducing or eliminating* the impact over time by preservation and maintenance during the life of the action.
>
> *Compensating* for the impact by replacing or providing substitute resources or environments.

Note: this SOP is limited to evaluation of compensatory mitigation plans for adverse ecological effects. However, before compensatory mitigation is considered, other categories of mitigation should be evaluated consistent with the sequence listed above. Applicants are encouraged to submit information demonstrating project planning and design following this sequenced approach.

Perennial streams: Streams that flow most of the year in a well-defined channel.

Riverine: Rivers, streams, and similar natural flowing waterbodies together with their associated adjacent wetlands and riparian zones.

Stream Sinuosity: The ratio of channel length/valley length. In addition to slope, the degree of sinuosity is related to channel dimensions, sediment load, stream flow, and the bed and bank materials.

Stable Stream: A stream that maintains its dimension, pattern, and profile over time such that the stream does not degrade or aggrade. Naturally stable streams are able to transport the sediment load supplied by the watershed. Instability occurs when scouring

causes the channel to incise (degrade) or when excessive deposition causes the channel bed to rise (aggrade).

Stream Order: A systematic process for describing the degree of branching of a stream network within a watershed. The order of any stream segment is determined by starting at the headwaters and labeling each unbranched tributary as order one (first order stream). Where two order one streams come together, a second order stream is designated. Similarly, when two second order streams merge, a third order stream is created. The junction of any two streams of equal order results in a stream of the next higher order.

Stream Pattern: The view of a stream channel as seen from above (map view).

Stream Profile: The longitudinal slope and contour of the stream. A stream profile will show channel slope as well as the length and depth measurements of riffles, pools and runs. Channel slope is inversely related to sinuosity, so steep streams have low sinuosity and flat streams have high sinuosity.

Stream Type: Stream type is based on the "Rosgen Stream Classification System" (Rosgen, 1996), which categorizes streams based on channel morphology so that consistent, reproducible and quantitative descriptions can be made. See the Appendix for a table of stream types.

Thalweg: The deepest part of the stream channel at any given location. Thalweg is used for surveying the longitudinal profile of a stream.

Width/Depth Ratio: The ratio of the bankfull width divided by the mean depth at bankfull (measured in a riffle section).

8. Attachments

8.1. Sample Cases

8.1.1. All Mitigation On-Site (Wetland)

Project Description

The project involves the construction of a single-family residential subdivision and golf course in a rapidly developing area of the coastal plain. The project site has historically been managed for timber production and consists of managed pine uplands interspersed with an extensive bottomland hardwood swamp system. The majority of the site, including wetlands, has been clearcut in the last ten years and partially drained by a series of ditches (Priority Category – Tertiary (0.1), Existing Condition – Partially Impaired (0.4)).

Project Impacts

Area 1
10 acres of permanent fill in bottomland hardwood wetlands (Lost Type A (4.0)) for the construction of access roads and residential lots (Dominant Impact – Fill (5.0), Duration – Over 10 Years (2.0)).

Area 2
2 acres of clearing in bottomland hardwood wetlands for golf fairway construction (Dominant Impact – Clearing (1.0), Duration – Over 10 Years (2.0)).

Area 3
1 acre of excavation in bottomland hardwood wetlands for stormwater pond construction (Dominant Impact – Dredge (2.0), Duration – Over 10 Years (2.0)).

Proposed Mitigation

All mitigation will be performed on-site and concurrent with the impacts (Credit Schedule – Schedule 3 (0.2)). All mitigation areas will include 25' riparian buffers and will be protected by deed restrictions with oversight by a POA (Control – Covenant POA (0.1)).

Unit 1
Restoration of 15 acres of wetlands that have been converted to a pine monoculture by clearing, site preparation and the planting of a bottomland hardwood plant community (Net Improvement 3.0).

Unit 2
Preservation of 100 acres of partially drained bottomland hardwood wetlands (Existing Condition – Partially Impaired (2.0)).

* Both the restoration and preservation units involve the establishment of 25' upland buffers with an average tree age of 20 years and requiring no restoration.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BWM
From tables: PM=15-50 years (0.3), RM= 0, no restoration of buffers needed and
BWM= 1:1 Adequate (1.0)

BI = (100% Preservation x 0.3) + (0%Restoration x 0) x 1.0
BI = 0.3 x 1.0
BI = 0.3

Wetland Required Mitigation Credit Worksheet

Wetland Required Mitigation Credit						
	Area 1 (Fill)	Area 2 (Clear)	Area 3 (Dredge)	Area 4	Area 5	Area 6
Lost Type (Wetland)	4.0	4.0	4.0			
Priority Category	0.5	0.5	0.5			
Existing Condition	2.0	2.0	2.0			
Duration	2.0	2.0	2.0			
Dominant Impact	5.0	1.0	2.0			
Cumulative Impact	0.65	0.65	0.65			
Sum of r Factors (R)	14.15	10.15	11.15			
Impacted Area (Acres) (AA)	10.0	2.0	1.0			
Debit = R x AA=	141.5	20.3	11.2			
					Total Debit = Σ (R x AA):	**172.95**

Wetland Proposed Mitigation Credit Worksheet

Wetland Proposed Mitigation Credit						
	Unit 1 (Restoration)	Unit 2 (Preservation)	Unit 3	Unit 4	Unit 5	Unit 6
Net Improvement	3.0	N/A				
Buffer	0.3	0.3				
Priority Category	0.1	0.1				
Existing Condition	N/A	0.4				
Control	0.1	0.1				
Credit Schedule	0.2	0				
Kind	0.3	0.3				
Location	0.3	0.3				
Sum of m Factors (M)	4.3	1.5				
Mitigation Area (Acres) (AA)	15.0	100.0				
M × A=	64.5	150.0				
					Total Preservation/Restoration Credit = Σ (M x A):	**214.50**

Wetland Mitigation Summary Worksheet

Wetland Mitigation Summary		
I. Required Mitigation		**Credits**
A.	**Required Mitigation Credit (RMC):**	172.95

II. Non-Banking Mitigation Credit Summary		**Acres**	**Credits**
B.	Restoration:	15	64.5
C.	Preservation:	100	150.0
D.	**Total Proposed Non-Bank Mitigation = B+C:**	115	214.5

III. Banking Mitigation Credit Summary		**Acres**	**Credits**
E.	Restoration:	0	0
F.	Preservation:	0	0
G.	**Total Proposed Bank Mitigation = E+F:**	0	0

IV. Grand Totals		**Acres**	**Credits**
H.	Total Restoration Mitigation ($Credit_{WR}$) = B+E:	15	64.5
I.	Total Preservation Mitigation ($Credit_{WP}$) = C+F:	100	150.0
J.	**Total Proposed Mitigation Credit (PMC) = D+G:**	**115**	**214.5**

V. Mitigation Checks	**Yes**	**No**
Is PMC ≥ RMC (Is "J" greater than "A")?	X	
Is $Credit_{WR}$ ≥ ¼ RMC (Is "H" greater than 25% of "A")?	X	

The Total Proposed Mitigation Credits (214.5) is more or less equal to the Total Required Mitigation Credits (172.95) and the credits for restoration (64.5) are greater than ¼ of the required credits (43.2). Therefore, the quantity and mix of mitigation is acceptable. The Project Manager must also review the other aspects of the mitigation plan to assure that it is generally in compliance with the policies and guidelines for mitigation.

On-Site Mitigation Combined With Mitigation Bank Credits (Wetland)

For this sample case let us assume that the impacts are the same as in the previous case sample. Thus we need 172.95 mitigation credits. Also assume the proposed 100 acres of preservation is reduced to 50 acres, giving us 75 credits of preservation on-site. However, instead of 15 acres of on-site restoration, assume only 4.0 acres of on-site restoration is proposed. The remaining required credits will be obtained from a Mitigation Bank. Similar to the previous example we can quickly calculate the following.

Proposed Non-Bank Preservation	= 1.5x 50	= 75
Proposed Non-Bank Restoration (Non-Buffer Enhancement)	= 4.3× 4.0	= 17.2
Total Proposed Non-Bank Mitigation Credits		**= 92.2**
Total Mitigation Credits Required		= 172.95
Total Proposed Non-Bank Credits		= 92.2
Additional Credits Needed		**= 80.75**

We also must consider the no net loss requirement that at least a forth of the mitigation credits should be from categories other than preservation. Since a Mitigation Bank may offer preservation or non-preservation credits, we need to know the number of non-preservation credits needed.

Non-Preservation Credits Required	= ¼ × 172.9	= 43.2
Proposed Non-Preservation Credits		= 17.2
Additional Non-Preservation Credits Needed		**= 26.0**

Therefore, the applicant must obtain a total of 80.75 credits from a mitigation bank of which 26.0 credits must be non-preservation credits. The completed summary worksheet is as follows.

Wetland Mitigation Summary Worksheet

Wetland Mitigation Summary		
I. Required Mitigation		**Credits**
A.	**Required Mitigation Credit (RMC):**	172.95

II. Non-Banking Mitigation Credit Summary		**Acres**	**Credits**
B.	Restoration:	4	17.2
C.	Preservation:	50	75
D.	**Total Proposed Non-Bank Mitigation = B+C:**	54	92.2

III. Banking Mitigation Credit Summary		**Acres**	**Credits**
E.	Restoration:	Determined by bank	26.0
F.	Preservation:	Determined by bank	54.7
G.	**Total Proposed Bank Mitigation = E+F:**		80.75

IV. Grand Totals		**Acres**	**Credits**
H.	Total Restoration Mitigation ($Credit_{WR}$) = B+E:	4+(determined by bank)	43.2
I.	Total Preservation Mitigation ($Credit_{WP}$) = C+F:	50+ (determined by bank)	129.7
J.	**Total Proposed Mitigation Credit (PMC) = D+G:**	**54+ (determined by bank)**	**172.95**

V. Mitigation Checks	**Yes**	**No**
Is PMC ≥ RMC (Is "J" greater than "A")?	X	
Is $Credit_{WR}$ ≥ ¼ RMC (Is "H" greater than 25% of "A")?	X	

The Total Mitigation Credits (Row J) is equal to or greater than the total Required Mitigation Credits (Row A), Row I equals at least 25% of Row A. Therefore, the proposed mix and/or quantity of mitigation is acceptable. The number of acres required from the bank to obtain these credits will depend upon the approved banking documents and must be calculated by the bank operator. The calculation of bank acres used should be submitted with both the project mitigation proposal and the regular accounting summary for the Mitigation Bank.

8.1.3.

A Variable Credits Mitigation Bank (Wetland)

This sample case demonstrates application of the Mitigation SOP to a Mitigation Bank proposal setup to provide a variable number of mitigation credits in the bank. The MBRT and the Bank Operator have agreed that the method of calculating bank credits given in the Mitigation SOP is acceptable for this bank. Therefore, the MBRT has assigned credit factors from the SOP tables for each unit of the bank. This sample bank consists of 4 units defined in the Banking Agreement document. The classification scheme used could be whatever the Mitigation Bank Review Team (MBRT) finds suitable for the particular banking proposal. The Team has reviewed the bank proposal and determined appropriate categories for the Location and Kind factors. They also have agreed on a credit release schedule for the bank that allows for the release of 25% of the total credits prior to final determination of success (Credit Schedule – Schedule 4 (0.1)). Bank specific tables and definitions will be made a part of the Banking Agreement.

Unique Definitions for Sample Mitigation Bank.

Kind is a factor used to compare the relative functions and values of the mitigation site to the impact site. The Sample Mitigation Bank shall not be used as compensatory mitigation for any type that does not fit into one of the categories given below unless approved on a case specific basis. For the purposes of the Sample Mitigation Bank, the kind categories are defined as follows:

Category 1: Bottomland Hardwoods, Riverine
Category 2: Bottomland Hardwoods, Non-riverine
Category 3: Not defined for this bank
Category 4: Isolated and depressional wetlands
Category 5: All other kinds subject to MBRT approval

Location is a factor used to compare the relative location of the mitigation site to the impact site. The Sample Mitigation Bank shall not be used as compensatory mitigation for impacts that are outside of the zones given below unless approved on a case specific basis. Service Unit Areas are defined in the Joint Federal and State Standard Operating Procedures for Mitigation Banking. For the purposes of the Sample Mitigation Bank, the location categories defined by 8-digit Hydrologic Unit Codes (HUC) are as follows:

Zone 1: 3050205, mid-Atlantic flatwoods
Zone 2: 3050202, 3050208, 3050206, 3050207, mid-Atlantic flatwoods
Zone 3: Not defined for this bank
Zone 4: Not defined for this bank
Zone 5: Out of service area, subject to MBRT approval

Bank Description

The proposed sample bank consists of 350 acres located adjacent to the Edisto River, in the coastal plain and immediately upstream of a State Heritage Preserve (Priority Category – Primary (0.3)). Each unit of the bank will have an average 50' wide forested buffer. A conservation easement will be placed on the entire mitigation bank area (Control – Conservation Easement (0.3)).

Bank Units

Unit 1 (160 acres)

*The restoration of agricultural fields to natural wetlands, by plugging ditches and planting hardwood trees (Net Improvement – 4.0).

*The 50' buffer will be replanted with hardwoods.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BWM
From tables: PM= 0, all buffers restored, RM= Good (0.3), and BWM= 1:1 Adequate (1.0).

BI = (0% Preservation x 0) + (100% Restoration x 0.3) x 1.0
BI = 0.3 x 1.0
BI = 0.3

Unit 2 (50 acres)

*The enhancement of hardwood forest wetlands by filling drainage ditches to restore natural hydrology (Net Improvement – 2.0).

*The 50' buffer in this area will be preserved in its existing condition. The buffer is currently vegetated with hardwood trees that are greater than 50 years old.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BWM
From tables: PM= 0.5 (Average Tree Age > 50, RM= 0, and BWM= 1.0 (1:1 Adequate)

BI = (100% Preservation x 0.5) + (0% Restoration x 0) x 1.0
BI = 0.5 x 1.0
BI = 0.5

Unit 3 (100 acres)

*The restoration of bedded pine wetlands to natural wetlands by leveling beds and planting hardwood trees (Net Improvement – 3.0).

*50% of the 50' buffer will be replanted in hardwood trees. The remainder of the buffer will be preserved in its existing condition. This portion of the buffer is currently vegetated with hardwood trees with an average age of 20 years.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BWM
From tables: PM= 0.3 (Average Tree Age 20 yrs, RM= 0.3 (Good Restoration), and BWM= 1.0 (1:1 Adequate)

BI = (50% Preservation x 0.5) + (50% Restoration x 0.3) x 1.0
BI = 0.25 + 0.15 x 1.0
BI = 0.4

Unit 4 (40 acres)

*Preservation of undisturbed wetlands (Existing Condition – Fully Functional (0.5)).

*The 50' buffer in this area will be preserved in its existing condition. The buffer is currently vegetated with hardwood trees that are greater than 50 years old.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BWM
From tables: PM= 0.5 (Average Tree Age > 50, RM= 0, and BWM= 1.0 (1:1 Adequate)

BI = (100% Preservation x 0.5) + (0% Restoration x 0) x 1.0
BI = 0.5 x 1.0
BI = 0.5

Wetland Mitigation Credit Worksheet

Wetland Mitigation Credit						
	Unit 1 (Restoration)	Unit 2 (Restoration)	Unit 3 (Restoration)	Unit 4 (Preservation)	Unit 5	Unit 6
Net Improvement	4.0	2.0	3.0	N/A		
Buffer	0.3	0. 5	0.4	0. 5		
Priority Category	0.3	0.3	0.3	0.3		
Control	0.3	0.3	0.3	0. 3		
Existing Condition	N/A	N/A	N/A	0.5		
Credit Schedule	0.1	0.1	0.1	0.1		
Kind	0 – 0.3	0 – 0.3	0 – 0.3	0 – 0.3		
Location	0 – 0.3	0 – 0.3	0 – 0.3	0 – 0.3		
Sum of m Factors (M)	5.0 – 5.6	3.2 –3.8	4.1– 4.7	1.7 – 2.3		
Mitigation Area (Acres) (AA)	160	50	100	40		
M × A=	800-896	160-190	410-470	68-92		
				Total Preservation/Restoration Credit = Σ (M x A):		**1438-1648**

The number of credits the bank operator may be able to sell will be not more than 1648 if sales are all for projects in the optimal kind category and location zone. Of this total, 92 credits are classified as preservation and the remaining 1556 credits are classified as restoration.

The total wetland acres in the bank will be 350. When credits are used, both the number of credits and acres consumed are calculated and recorded. When all 350 acres have been consumed, no more credits may be sold from the bank.

Project Description

Construction of a single-family residential development in an urban setting located in the lower piedmont region of the state (Priority Category – Tertiary (0.5)). The project site is within a half a mile of an existing water reservoir and is bisected by an extensive perennial stream system. Portions of this stream system have been previously disturbed and are actively aggrading (Existing Condition – Partially Impaired (1.5)).

Project Impacts

Reach 1
The construction of a dam involving permanent fill of 30 linear feet of partially impaired, perennial stream (Lost Type – All Other Streams (4.0), Dominant Impact – Fill (5.0), Duration - >1 year (3.0)).

Reach 2
Impoundment of 500 linear feet of the same stream (Dominant Impact – Impound (4.0), Duration - >1 Year (3.0)).

Reach 3
The permanent piping of 150 linear feet of undisturbed perennial stream (Lost Type – All Other Streams (4.0), Existing Condition – Fully Functional (3.0), Dominant Impact – Pipe (4.2), Duration - >1 Year (3.0)).

Proposed Mitigation

All mitigation will be performed on-site and concurrent with the impacts (Credit Schedule – Schedule 3 (0.1)). All mitigation areas will include 100' riparian buffers and will be protected by deed restrictions with oversight by a POA (Control – Covenant POA (0.1)). The stream restoration plan was coordinated with the appropriate resource and regulatory agencies and deemed acceptable.

Reach 1
Preservation of 2000' of an undisturbed perennial stream (Existing Condition – Fully Functional (0.2)) and the establishment of riparian buffers on one side. The proposed buffer are 100' wide and has a 4% slope. 50% of the buffer will be restored by planting a native plant community and the remainder will be preserved in its existing condition. This area is currently vegetated with trees with an average age of 35 years.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BW x SB
From tables: PM= 0.3 (tree age 35 years), RM= 0.3 (good), BW= 1.5 (2x min.width), and SB= 0.5 (one side).

BI = (50% Preservation x 0.3) + (50% Restoration x 0.3) x 1.5 x 0.5
BI = 0.15 + 0.15 x 1.5 x 0.5

BI = 0.225

Reach 2
Preservation of an additional segment of the same stream as Reach 1, but includes the establishment of riparian buffers along both sides of the stream for a length of 3000'. The buffer characteristics and treatments are the same as in Reach 1.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BW x SB
From tables: PM= 0.3 (tree age 35 years), RM= 0.3 (good), BW= 1.5 (2x min.width), and SB=1.0 (both sides).

BI = (50% Preservation x 0.3) + (50% Restoration x 0.3) x 1.5 x 1.0
BI = 0.15 + 0.15 x 1.5 x 1.0
BI = 0.45

Reach 3
Restoring a perennial stream to a "daylighted" condition by removing 400 linear feet of culverts and establishing appropriate geomorphology based on a referenced, stable channel (Net Improvement – Excellent (6.0)). Proposed buffers along this reach are 100' wide and have a 6% slope. 100% of the buffer will be restored by planting a native plant community.

Buffer Improvement (BI) = ((% Preservation x PM) + (%Restoration x RM)) x BW x SB
From tables: PM= 0, RM= 0.3 (good), BW= 1.0 (min.width), and SB=1.0 (both sides).

BI = (0% Preservation x 0) + (100% Restoration x 0.3) x 1.0 x 1.0
BI = 0.3 x 1.0 x 1.0
BI = 0.30

Note* Minimum buffer width for the restoration area is calculated by multiplying the minimum width for single-family residential (50') by 2 to account for the 6% slope, yielding a minimum width of a 100' wide buffer to attain mitigation credit. In the preservation area where the slope is 4%, the 100' buffer is twice the minimum width.

Stream Required Mitigation Credit Worksheet

Linear Required Mitigation Credit						
	Reach 1 (dam)	Reach 2 (impound)	Reach 3 (pipe)	Reach 4	Reach 5	Reach 6
Lost Type	4.0	4.0	4.0			
Priority Category	0.5	0.5	0.5			
Existing Condition	1.5	1.5	3.0			
Duration	3.0	3.0	3.0			
Dominant Impact	5.0	4.0	4.2			
Cumulative Impact	0.34	0.34	0.34			
Sum of R Factors (R)	14.34	13.34	15.04			
Linear Feet Impact (LL)	30	500	150			
R X LL=	430.2	6670	2256			
					Total Debit = Σ (R X LL):	**9356.2**

Stream Proposed Mitigation Credit Worksheet

Proposed Linear Credit						
	Reach 1 (Preservation)	Reach 2 (Preservation)	Reach 3 (Restoration)	Reach 4	Reach 5	Reach 6
Net Improvement	NA	NA	6.0			
Buffer improvement (Side A)	0.23	0.45	0.3			
Buffer improvement (Side B)	NA	0.45	0.3			
Priority Category	0.05	0.05	0.05			
Existing Condition	0.2	0.2	0			
Control	0.1	0.1	0.1			
Credit Schedule	0.0	0.0	0. 1			
Kind	0.2	0.2	0.2			
Location	0.2	0.2	0.2			
Sum of Factors (M)	0.98	1.65	7.25			
Linear Feet (L)	2000	3000	400			
M x L	1960	4950	2900			
					Total Preservation/Restoration Credit = Σ (M x L x RM):	**9810**

Stream Mitigation Summary		
I. Required Mitigation		**Credits**
A.	**Required Mitigation Credit (RMC):**	9356.2

II. Non-Banking Mitigation Credit Summary		**Linear Feet**	**Credits**
B.	Stream Restoration:	400	2900
C.	Preservation:	5000	6910
D.	**Total Proposed Non-Bank Mitigation = B+C:**	5400	9810

III. Banking Mitigation Credit Summary		**Linear Feet**	**Credits**
E.	Stream Restoration:	0	0
F.	Preservation:	0	0
G.	**Total Proposed Bank Mitigation = E+F:**	0	0

IV. Grand Totals		**Linear Feet**	**Credits**
H.	Total Restoration Mitigation ($Credit_{SR}$) = B+E:	400	2900
I.	Total Stream Preservation Mitigation ($Credit_{SP}$) = C+F:	5000	6910
J.	**Total Proposed Mitigation Credit (PMC) = D+G:**	5400	9810

V. Mitigation Checks	**Yes**	**No**
Is PMC ≥ RMC (Is "J" greater than "A")?	X	
Is $Credit_{SR}$ ≥ ¼ RMC (Is "I" greater than 25% of "A")?	X	

The Total Proposed Mitigation Credits (9810) are greater than the Total Required Credits (9356.2) and the credits for stream restoration are greater than ¼ of the required credits. Therefore, the quantity and mix of mitigation is acceptable. The Project Manager must also review the other aspects of the mitigation plan to assure that it is generally in compliance with the policies and guidelines for mitigation.

On-site Mitigation Combined With Mitigation Bank Credits (Linear)

For this sample case let us assume that the impacts are the same as in the previous case sample. Thus we need 9356.2 mitigation credits. Also assume the same stream preservation that generates a total of 6910 credits. However, instead of 400 linear feet of stream restoration, assume only 150 linear feet of stream restoration is proposed and the remaining credits will be obtained from a Mitigation Bank. Similar to the previous example we can calculate the following:

Proposed Preservation (non restoration)		= 6910
Proposed Stream Restoration	= 7.25 x 150	= 1087.5
Total Proposed Non-Bank Mitigation Credits		**=7997.5**

The additional credits needed are:

Total Mitigation Credits Required	= 9356.2
Total Proposed Non-Bank Credits	=7997.5
Additional Credits Needed	**= 1358.7**

We also must consider the requirement that at least ¼ of the required mitigation credits should be from stream restoration. Since a mitigation bank may offer stream restoration or stream preservation credits, we need to know the number of stream restoration credits needed.

Stream Restoration Credits Required	= ¼ X 9356.2	= 2339.1
Proposed Stream Restoration Credits		= 1087.5
Additional Stream Restoration Credits Needed		**= 1251.5**

The applicant then obtains 1358.7 credits from a mitigation bank of which at least 1251.5 are stream restoration credits.

Stream Mitigation Summary		
I. Required Mitigation		**Credits**
A.	**Required Mitigation Credit (RMC):**	9356.2

II. Non-Banking Mitigation Credit Summary		**Linear Feet**	**Credits**
B.	Stream Restoration:	150	1087.5
C.	Preservation:	5000	6910
D.	**Total Proposed Non-Bank Mitigation = B+C:**	5150	7997.5

III. Banking Mitigation Credit Summary		**Linear Feet**	**Credits**
E.	Stream Restoration:	calculated by bank	1251.5
F.	Preservation:	calculated by bank	107
G.	**Total Proposed Bank Mitigation = E+F:**	calculated by bank	1358.5

IV. Grand Totals		**Linear Feet**	**Credits**
H.	Total Restoration Mitigation ($Credit_{SR}$) = B+E:	150+(calculated by bank)	2339.2
I.	Total Stream Preservation Mitigation ($Credit_{SP}$) = C+F:	5000+(calculated by bank)	7017
J.	**Total Proposed Mitigation Credit (PMC) = D+G:**	5150+(calculated by bank)	**9356.2**

V. Mitigation Checks	**Yes**	**No**
Is PMC ≥ RMC (Is "J" greater than "A")?	X	
Is $Credit_{SR}$ ≥ ¼ RMC (Is "I" greater than 25% of "A")?	X	

The Grand Total Proposed Credits are equal to the required credits and the Grand Total Stream Restoration Credits are equal to at least ¼ of the total required credits. Therefore, the proposed mix and types of mitigation satisfy the policy. The number of linear feet required from the bank to obtain these credits will depend on the approved banking documents and must be calculated by the bank operator. The calculation of bank linear feet used should be submitted with both the project mitigation proposal and the regular accounting summary for the Mitigation Bank.

Placeholder for Rosgen Stream Classification Info (page 1 of 2)

Placeholder for Rosgen Stream Classification Info (Page 2 of 2)

8.2. Restrictive Covenants Model

The statutory authority of the U.S. Army Corps of Engineers includes the issuance of permits under Section 404 of the Clean Water Act (33 U.S.C. 1344), and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). Section 404 covers the discharge of dredged or fills material into wetlands or other waters of the United States. Section 10 prohibits the unauthorized obstruction or alteration of any navigable water of the United States. In some cases, both Sections 404 and 10 will apply. Under Section 404, the South Carolina Department of Health and Environmental Control ("DHEC") is responsible for certifying permits for consistency with coastal zone management and/or water quality. Prospective permittees under Section 404 may decide to perform what is known as "compensatory mitigation" in return for unavoidable impacts to wetlands or other waters of the United States by the activities or work covered by a permit. A "conservation easement" is used to place permanent "conservation restrictions" on property containing wetlands. The conservation restrictions contained in conservation easements significantly limit the property's future use. The easement is conveyed to a third-party, or "holder," which is typically a land trust (the South Carolina Department of Archives and History's conservation easement webpage includes a list of local land trusts), not-for-profit conservation organization, or governmental entity (the Corps of Engineers will not be a holder). Other alternatives for compensatory mitigation include use of a "declaration of restrictive covenants," or "mitigation banking."

Conservation easements may have tax advantages for the landowner. Circumstances will vary, and it is up to the individual landowner to determine the appropriate tax treatment or deductibility. The Corps of Engineers makes no representation whatsoever as to the appropriate tax treatment for a particular conservation easement. For a document in .pdf format providing an explanation of potential tax benefits entitled, *Local, State, and Federal Tax Aspects of Conservation Easements*, visit the South Carolina Department of Revenue publications web page.

Conservation easements are also used to place conservation restrictions on areas approved as "mitigation banks." A mitigation bank is a site where wetlands are restored, enhanced, created and/or preserved for the purpose of providing compensatory mitigation. The bank obtains credits for these activities, which it then offers for sale to prospective permittees. For additional details on wetlands banking click here.
The purpose of the model conservation easement is to allow permit applicants to insert specific information into a prepared legal document. Changes necessary to customize the model, such as the identification of parties or real property, or the selection of other italicized provisions, will generally be approved without extended review. Additional changes or alternatives to the model proposed by the permit applicant may result in a more extended regulatory and legal review, and are subject to approval on a case-by-case basis. ANY proposed changes, including those necessary to customize the model, must be clearly identified when the permit applicant submits the proposed conservation easement for preliminary approval; if all changes are not clearly identified, the document may be returned to the applicant without approval. ALL conservation easements must be approved by the Corps of Engineers and DHEC before recording.

For explanation of other aspects of these compensatory mitigation alternatives, and of Corps of Engineers permitting in general, please contact the Charleston District Regulatory Division at 69A Hagood Avenue, Charleston, South Carolina 29403, toll free (866) 329-8187.

STATE OF SOUTH CAROLINA

DECLARATION OF RESTRICTIVE COVENANTS

COUNTY OF

THIS DECLARATION OF RESTRICTIVE COVENANTS is made this ___ day of _____, 19__, by _____("Declarant*(s)*").

RECITALS

WHEREAS, Declarant*(s) is/are* the owner*(s)* of certain real property [*"real property" includes wetlands, lands underlying other waters of the U.S., uplands, associated riparian/littoral rights*] located in _____ County, South Carolina, more particularly described [*describe tract to be preserved, including: 1) acreage, 2) either a reference to recorded plat(s), or attach an approved permit drawing or site plan - see Paragraph 9, and 3) any excluded property*] ("Property"); and

WHEREAS, in consideration of the issuance of Department of the Army Permit No._____ ("Permit") to Declarant*(s)* by the U.S. Army Corps of Engineers, Charleston District ("Corps," to include any successor agency), *and certification(s) and/or permit(s) by the S.C. Department of Health and Environmental Control ("DHEC," to include any successor agency)*, and for the protection or enhancement of the Property's wetlands, scenic, conservation, resource, environmental, or other values, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Declarant*(s) has/have* agreed to place certain restrictive covenants on the Property, in order that the Property shall remain substantially in its natural condition forever, as provided herein.

NOW THEREFORE, Declarant*(s)* hereby declare*(s)* that the Property shall be held, transferred, conveyed, leased, occupied or otherwise disposed of and used subject to the following restrictive covenants, which shall run with the land and be binding on all heirs, successors, assigns, lessees, or other occupiers and users.

1. Declarant*(s) is/are* and shall be prohibited from the following: filling, draining, flooding, dredging, impounding, clearing, burning, cutting or destroying vegetation, cultivating, excavating, erecting, constructing, or otherwise doing any work on the Property; introducing exotic species into the Property; and from changing the grade or elevation, impairing the flow or circulation of waters, reducing the reach of waters, and any other discharge or activity requiring a permit under clean water or water pollution control laws and regulations, as amended. The following are expressly excepted from this paragraph: a) cumulatively very small impacts associated with hunting (excluding planting or burning), fishing, and similar recreational activities, consistent with the continuing natural condition of the Property [*reference may also be made to the Permit, or to a mitigation plan approved by the Permit, provided all exceptions (including those relating to buffer areas) are specifically spelled out in the Permit or plan; OR, additional*

exceptions may be specifically listed in this paragraph, e.g., fire or wildlife management plans].

2. After recording, these restrictive covenants may be altered by modification of the Permit pursuant to applicable Corps regulations and policy, provided all agencies that certified the Permit concur with the modification, and subject to consultation with other resource agencies as appropriate. Such modifications become a part of these restrictive covenants. Declarant may request to trade in entirety property that is not encumbered by conservation easements or covenants for the Property herein, provided such substitute property is of equivalent functions and values as the Property herein, and is placed under equivalent conservation restrictions.

3. Any permit application, or request for certification or modification, which may affect the Property, made to any governmental entity with authority over wetlands or other waters of the United States, shall expressly reference and include a copy of these restrictive covenants.

4. It is expressly understood and agreed that these restrictive covenants do not grant or convey to members of the general public any rights of ownership, entry or use of the Property. These restrictive covenants are created solely for the protection of the Property, wetlands, and associated values, and Declarant*(s)* reserve*(s)* the ownership of the fee simple estate and all rights appertaining thereto, including without limitation the rights to exclude others and to use the property for all purposes not inconsistent with these restrictive covenants.

5. The Corps, *DHEC*, and *its/their* authorized agents shall have the right to enter and go upon the lands of the Declarant*(s)*, to inspect the Property and take actions necessary to verify compliance with these restrictive covenants.

6. The Declarant*(s)* grant*(s)* to the Corps, the U.S. Department of Justice, and/or *DHEC*, a discretionary right to enforce these restrictive covenants in a judicial action against any person*(s)* or other entity(ies) violating or attempting to violate these restrictive covenants; provided, however, that no violation of these restrictive covenants shall result in a forfeiture or reversion of title. In any enforcement action, an enforcing agency shall be entitled to a complete restoration for any violation, as well as any other judicial remedy. An enforcing agency shall also be entitled to costs and attorneys fees in any enforcement action in which it obtains relief. Nothing herein shall limit the right of the Corps to modify, suspend, or revoke the Permit.

7. Declarant*(s)* shall include the following warning on all deeds, mortgages, plats, or any other legal instruments used to convey any interest in the Property:

WARNING: This Property Subject to Declaration of Restrictive Covenants
Recorded at [*insert book and page numbers (if Property lies in more than one county,*

of same county(ies) as instrument(s)) of Declaration].

8. The perimeter of the Property shall at all times be plainly marked by permanent signs saying, "Protected Natural Area," or by an equivalent, permanent marking system.
[*Paragraph 9 - generally, a surveyed, recorded plat is required; however, at the discretion of the Corps and DHEC, an approved permit drawing or site plan attached to these restrictive covenants may suffice*]

9. A plat depicting the boundaries of the Property subject to these restrictive covenants shall be recorded in the RMC office for each county in which the Property is situated prior to the recording of these restrictive covenants. The plat*(s) is/are* recorded at [*include book and page references, county(ies), and date of recording*].

10. Should any separable part of these restrictive covenants be determined to be contrary to law, the remainder shall continue in full force and effect.

IN WITNESS WHEREOF, the Declarant*(s) has/have* duly executed this Declaration of Restrictive Covenants the date written above.

IN THE PRESENCE OF: Declarant*(s)*

_____ By: _____

_____ *Its:* _____

STATE OF SOUTH CAROLINA

PROBATE

COUNTY OF

PERSONALLY appeared before me _____, the undersigned witness, and made oath that *he/she* saw the within named _____ [, *by* _____, *its* _____,] sign, seal and as *his/her/its* act and deed, deliver the within named Declaration of Restrictive Covenants; and that *he/she* with the other witness named above witnessed the execution thereof.

_____
[*signature of witness*]

SWORN to and subscribed before me
this ___ day of _____, 19___.

NOTARY PUBLIC FOR SOUTH CAROLINA

My Commission Expires: