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CHARLESTON DISTRICT, CORPS OF ENGINEERS  
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Regulatory Branch - Standard Operating Procedure

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Compensatory Mitigation Plans for Nationwide Permits and Small Projects

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**1. Applicability.** This SOP is intended to be applied only to compensatory mitigation requirements for adverse ecological effects under Nationwide Permits and other small projects where more rigorous, detailed studies (e.g., WET, HEP) are not considered practical or necessary. For the purposes of this SOP, small projects will be considered those with total adverse affects greater than one acre and less than ten acres. This SOP does not address mitigation for categories of effects other than ecological (e.g., historic, cultural, aesthetic). Also, types of mitigation other than compensation (e.g., avoidance, minimization, reduction) are not addressed by this SOP. The guidance and procedures given herein are applicable to all such Department of the Army regulatory actions requiring mitigation plans in the State of South Carolina.

**2. Purpose.** The intent of this SOP is to provide a basic written framework which 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 methodology for calculating mitigation credits. While this methodology is not intended for use as project design criteria, appropriate application of the methodology should minimize uncertainty in the development and approval of mitigation plans and allow expeditious review of applications. However, nothing in this SOP should be interpreted as a promise or guarantee that a project which satisfies the criteria or guidelines given herein will be assured of a permit. 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. 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.

**3. Other Guidance.** In addition to the policies and requirements set forth in this SOP for Department of the Army permits, there may be other guidance provided by State or Federal resource or permitting agencies. For projects impacting less than one acre of wetlands in the Coastal Zone, the CoE will routinely defer exclusively to any compensatory mitigation requirements approved by the South Carolina

Coastal Council (SCCC). Projects impacting more than one acre of wetlands will usually have to satisfy the requirements of this SOP in addition to any requirements imposed by SCCC. The policies and regulations regarding mitigation are still evolving and it is possible that conflicting guidance may occasionally be provided. Every effort has been made in the preparation of this SOP to minimize or eliminate such discrepancies. If a significant conflict is discovered between this SOP and any other relevant guidance regarding mitigation, the applicant should notify Charleston District's Regulatory Branch of the conflict and request clarification before incorporating any such guidance into a proposed plan.

**4. Mitigation Equation.** When a mitigation plan is required, it will be evaluated by the following formula. This formula is not intended to represent an exact or proven scientific methodology. Rather, it is based on the judgment of regulatory staff and resource agencies. It is intended to establish a clear, understandable, and consistent methodology for use by applicants and regulators. The definitions and explanations for all values and factors used in these equations are provided as *Attachments A and B*. As additional experience with this procedure is gained, it is possible that the tables of factors will be reviewed and adjusted. When using this equation always use the most recent approved edition of these tables. Case specific worksheets are provided as *Attachment C* and example cases demonstrating the application of the mitigation formula are provided as *Attachment D*. Since there are a large number of possible variations in proposed mitigation projects, it is not practicable to provide all possible worksheet combinations. However, the attached worksheets should suffice for the majority of mitigation proposals.

For those who desire a deeper understanding of the procedure, the following discussion and details are provided. Simply stated, the mitigation equation requires that for a mitigation proposal to be acceptable, the Proposed Mitigation Credits (PMC) must be equal to or greater than the Required Mitigation Credits (RMC). Further, the portion of the PMC resulting from Restoration, Creation, and/or Enhancement must be at least 50% of the RMC. The mitigation credits for RMC and PMC are calculated using the values and the factors given in the attachments.

$$PMC \geq RMC$$

and,

$$PMC_{\text{Non-Preservation}} \geq \frac{1}{2} RMC$$

where,

PMC = Proposed Mitigation Credits

RMC = Required Mitigation Credits

$$RMC = \sum_{i=1}^N (R_i \times AA_i)$$

$$R_i = \sum_{i=1}^k r_i$$

$$PMC = \sum_{i=1}^n (M_i \times A_i)$$

$$M_i = \sum_{i=1}^k m_i$$

- AA<sub>i</sub> = The i<sup>th</sup> Adverse Affects Area
- R<sub>i</sub> = Adverse Affect Multiplier for AA<sub>i</sub>
- r = Adverse Affect Factor
- N = number of unique adverse affect areas
- k = number of factors under consideration

- A<sub>i</sub> = The i<sup>th</sup> Area of Mitigation
- M<sub>i</sub> = Mitigation Multiplier for A<sub>i</sub>
- m = Mitigation Factor
- n = number of unique mitigation areas

The RMC and PMC are each a summation of products. To calculate each product, one should first evaluate the areas under consideration and lump similar areas. It is appropriate to lump adverse affects areas (AA<sub>i</sub>) which involve the same adverse affect factors (r<sub>i</sub>). Similarly, it is appropriate to lump mitigation areas (A<sub>i</sub>) which involve the same mitigation factors (m<sub>i</sub>). For example, if there are four separate adverse affects areas but they are all to be filled, are all Type B wetlands, all fill will be permanent, and all work has a low preventability rating then all four areas can be lumped into one total area for purposes of calculating the RMC. Such lumping is just for mathematical simplification and will not affect the resulting calculations. The adverse affects multipliers (R<sub>i</sub>) for an area (AA<sub>i</sub>) are calculated by summing the applicable adverse affect factors (r<sub>i</sub>) selected from the attached tables. Similarly, the mitigation multipliers (M<sub>i</sub>) for a mitigation area (A<sub>i</sub>) are calculated by summing the applicable mitigation factors (m<sub>i</sub>) selected from the attached tables. The math is much simpler than the explanation.

Each category of mitigation (Restoration, Creation, etc.) has it own table of factors which are used to compute the credit multipliers for each unique mitigation area. Sample worksheets are provided for documenting and comparing the calculated PMC with the calculated RMC. These worksheets may be readily adapted for the computer.

**5. Mitigation Variance Approval.** The following formula and table establishes levels of authority for approval of mitigation plans where the proposed mitigation is not in accord with the mitigation formula. The mitigation variance shown in the table is the maximum variation which can be approved at the indicated level. This allowance for variance is intended only for situations where the mitigation formula is found to be unreasonable or otherwise not in the public interest. *The Project Manager must document the reasons for any approved variances.*

$$\text{Mitigation Variance} = \left( \frac{\text{Required} - \text{Proposed}}{\text{Required}} \right) \times 100\%$$

Mitigation Variance	Approval Authority
0 - 15%	Project Manager
15 - 30%	Section Chief
30 - 50%	Branch Chief
over 50%	District Engineer

**6. Processing Procedures.**

6.1. *Information required.* The following information will be required for consideration of a mitigation proposal. Applicants are encouraged to provide the CoE multiple (at least 8) copies of proposals to expedite agency notification. The CoE will review all proposals and the applicant will be advised what additional information will be required to make the proposal adequate for consideration. The following information requirements relate exclusively to review of mitigation proposals. Other information may be

needed as part of the CoE General Permit Notification process, Nationwide Permit Notification process, or Individual Permit process. Those requirements are not addressed herein.

- a. Plans and detailed information regarding the work for which the mitigation is required.
- b. Drawings in accordance with the requirements given in this SOP.
- c. A proposed monitoring plan and a plan for documenting baseline conditions of the mitigation site.
- d. Names, addresses, and phone numbers for all parties responsible for mitigation and monitoring.
- e. A description of the existing conditions of all areas to be affected by the proposed mitigation.
- f. A narrative discussion of the key elements of the proposed mitigation plan.
- g. A schedule showing earliest start and latest completion dates for all significant activities.
- h. A listing of measurable success factors with quantifiable criteria for determining success.
- i. Definitions for all success factors and other significant terms used in the plan.
- j. Description of the equipment, materials, and methods required for execution of the plan.
- k. A management plan, if necessary, for any maintenance of the mitigation. (Note well Article 7.7)

6.2. *Distribution.* Generally, complex mitigation proposals requiring bound or voluminous information shall not be distributed via public notice mailings in order to minimize reproduction and mailing costs. For minor projects with mitigation proposals which are fully shown on a few pages, the Project Manager may include the mitigation proposal with the public notice for the permit application. When the proposal is distributed via the public notice it must be clearly labeled as the mitigation proposal.

**7. General Guidelines.** All mitigation must be designed in accordance with the following guidelines. A mitigation area may not be given credits under more than one mitigation category. For example, a contiguous created wetland area donated to a conservancy organization with a deed restricted upland buffer may be credited as either creation or enhancement or preservation but can only be credited as one of the three allowable types.

7.1. *Preservation.* Such protection must include restrictive covenants or similar measures setting the preserved areas aside in perpetuity as natural areas. The covenants must be duly recorded with the appropriate local entity (i.e., Clerk of Court, RMC, etc.). **The covenants must declare that no alterations such as clearing, grubbing, cutting, draining, filling, etc., can occur in these areas.** The applicant may contact Charleston District for sample language for the restrictive covenants. In the event that these areas are conveyed to another organization (e.g., homeowners association) or if any parts of these areas are sold to individuals, the preservation area must be clearly shown on the plat and defined in appropriate documents utilized for that transaction. The permittee will be responsible for insuring that each buyer is advised of the restrictions on the use of the property. In calculating mitigation credits it will not be allowed to provide a majority of the required mitigation thru preservation. At least 50% of the required mitigation credit must be from restoration, creation, and/or enhancement.

7.2. *Buffer Zones.* In order to assure that buffer zones serve the intended use in perpetuity, they should be protected by restrictive covenants or similar measures as stated in Section 7.1 above. Buffer zones which have acceptable restrictive covenants will qualify as preservation for the calculation of mitigation credits. **Buffers which do not have acceptable restrictive covenants will not be included or considered in the calculation of mitigation credits.** In general, buffers should be of adequate width to serve the intended purpose. In calculating mitigation credits, only those portions satisfying the width requirements given in the following table will be considered. Buffers which do not meet the minimum average width requirement will not be included in calculating mitigation credits. Buffers which exceed the allowed maximum average width will be included in calculating credits, but the calculation for such areas shall be based on the allowed maximum stated in the table and not on the actual width.

Buffer Zone Width Standards for Mitigation Credit

Adjacent Land Use Category	Minimum Average Width in Feet	Maximum Average Width in Feet
Single Family Residential	35	50
Multi-Family Residential	50	75
Commercial	75	100
Industrial	75	100
Landfill	75	150

7.3. *Enhancement.* Except for the provisions stated below for buffering credits, proposed mitigation plans for enhancement must include the following information:

- a. An explanation of what values or functions are being enhanced and to what degree.
- b. A narrative description of how the enhancement will be accomplished.

7.3.1. *Enhancement by Buffering.* When a proposed mitigation plan includes buffer zone(s) with acceptable restrictive covenants which completely surround the perimeter of a special aquatic site, and the surrounded site is also protected by acceptable restrictive covenants, then enhancement mitigation credit will be allowed for the surrounded special aquatic site. When buffer zone(s) with acceptable restrictive covenants partially surround a special aquatic site, and the aquatic site is protected by acceptable restrictive covenants, then enhancement credit will be allowed for a portion of the aquatic site. Such portion shall equal the area of the surrounding preservation buffer or the area of the special aquatic site, whichever is less. The surrounding buffer zones(s) may not include any portion of the aquatic site. That is to say, it is not allowed to designate a portion of the aquatic site as preservation buffer in order to gain enhancement credit for the remaining area. The credited surrounding buffer zone must consist of uplands. Any significant aquatic portions of the buffer zone will not be included in calculating enhancement credits.

7.3.2. *Enhancement of Lakes and Ponds.* Enhancement of lakes or ponds will generally not be allowed as compensatory mitigation for adverse impacts to vegetated wetlands. Credit may be allowed as compensation for impacts to other open surface waterbodies if buffer zone(s) are established around the perimeter of the lake or pond and the buffer zone(s) have acceptable restrictive covenants. Enhancement credits for such buffered lakes and ponds shall be based on an area of the waterbody equal to the area of the restricted buffer zone surrounding the waterbody. For example, if an 18 acre lake is partially or totally surrounded by an acceptable 5 acre deed restricted buffer zone then enhancement credit will be allowed for a five acre portion of the lake.

7.4. *Creation.* In designing creation mitigation, care should be taken to avoid the selection of high quality upland habitat for conversion. Designers should use good judgment in selecting sites for wetland creation. For example, a cut-over area or former agricultural field would be ecologically preferable to a mature forested area as a candidate for alteration. Mature forested areas will generally not be approved as suitable creation areas.

7.4.1. *Creation of Lakes and Ponds.* Creation of lakes or ponds may be allowed as compensation for impacts to other open surface waterbodies. Creation of lakes or ponds will generally not be acceptable as compensatory mitigation for adverse impacts to vegetated wetlands. However, it is understood that created waterbodies may provide some valuable public interest factors such as storm water storage, fisheries habitat, or ground water recharge. Therefore, in recognition of this counterbalancing effect, the adverse affect factor for flooding has been made significantly lower than most other factors in its category.

7.5. *Location.* Where practicable and feasible, mitigation should be on the project site and within the same watershed as the area of adverse impacts for which the mitigation is required. Mitigation which fails to meet this standard will always result in a lower credit calculated under the mitigation equation.

7.6. *Scheduling.* When practicable and feasible, all mitigation should be completed either prior to or concurrent with the authorized activity. The preferred method is to complete mitigation prior to the commencement of the permitted activity. However, it is recognized that because of equipment utilization the permittee may need to perform the mitigation work concurrently with the overall project. This is usually acceptable provided that the time lag between the alteration and mitigation is minimized and the mitigation work is completed within one growing season of the commencement of the authorized alteration. Justification must be provided for all schedules showing less than 50% completion of the mitigation work prior to commencement of the permitted activity.

7.7. *Maintenance.* Mitigation plans which require periodic maintenance, management, or other human intervention will usually not be acceptable to the CoE. All mitigation areas should be designed to be naturally sustaining following the completion of the mitigation. Care should be taken that hydrology is adequately considered since plans requiring an energy subsidy (pumping, intensive management, etc.) will normally not be acceptable.

7.8. *Contingency Measures.* For major mitigation projects, the plan must include contingency measures specifying remediation procedures which will be followed should the success criteria or scheduled performance criteria not be fully satisfied. The contingency measures must list the names, addresses, and phone numbers of all parties responsible for the remediation. The contingency measures must provide for an alternative mitigation location should the initial site prove unsuccessful.

**8. Monitoring 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. Such reports will normally involve photographic documentation and information on species survival rates. Because of the many variables involved, no specific standards are set forth as a part of this policy. Instead, a monitoring plan must be submitted as a part of the mitigation proposal for review. All monitoring efforts should include, as a minimum, quarterly reviews in the first year and annually thereafter. Samples of previously submitted and approved monitoring plans will be made available upon request.

**9. Drawings.** Mitigation plans must include drawings in conformance with the following requirements.

a. Drawings must be provided on 8.5 x 11 inch or 8.5 x 14 inch paper. For major mitigation projects, plans must also be submitted on paper sized no smaller than 18 x 24 inch and no greater than 30 x 42 inch. Drawings must be clear, readable, and reproducible on standard, non-color office copiers. Each drawing sheet must include the following:

- (1) an unused margin of no less than ½ inch and no greater than 2 inches;

- (2) an appropriate graphic scale (where reasonable);
- (3) all significant dimensions clearly indicated and annotated;
- (4) title block with applicant's name, project title, site location, drawing date, and drawing number;
- (5) a north arrow.

b. Location maps for the proposed activity must be included. Two maps are needed. A County road map and a US Geological Quadrangle map are recommended as sources. The location maps must show roads leading to the site and must include the name or number of these roads. The project latitude and longitude must be annotated on the maps. Each map must include a title block completed in accordance with 9.a.(4).

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 all Waters of the United States in the vicinity of the project.

d. For all non-preservation mitigation areas, cross section views must be shown through each mitigation area depicting the existing ground contour and the proposed finished contour.

e. All wetland areas within the project boundaries (avoided, impacted, or mitigated) must be shown.

f. All verified wetland boundaries must be shown.

g. Mitigation areas must be shown (enhancements, creations, restorations, etc.).

h. A legend must be shown identifying each type of cross-hatching, shading, or other marking techniques used.

i. A summary table indicating the quantity (area) of each category of impacted U. S. Waters (e.g. Carolina Bays, salt marsh, open surface river, etc.) and the quantity (area) of each category of mitigation must be shown on the drawings.

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

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

l. If the plan involves dredging in navigable waters, the drawings must include:

- (1) The method of dredging;
- (2) The site and plans for disposal of the dredged material;
- (3) A description of the type, composition and quantity of the material to be dredged.

m. If the plan includes the discharge of dredged or fill material into Waters of the United States or the transportation of dredged material, the drawings must include:

- (1) The source of the material;
- (2) A description of the type, composition and quantity of the material;
- (3) The method of transportation and disposal of the material;
- (4) The location of the disposal site.

n. For mitigation plans which involve more than ten acres of creation, restoration, enhancement, or a combination thereof, verified topographic maps showing the contours and elevations of the completed mitigation area must be submitted. The verified drawings must show the locations of plantings, type of plantings, and all other structures and work which are a significant part of the mitigation.

**10. Mitigation Banking.** Proposals involving mitigation banking must be in accordance with current guidelines in use by the Corps of Engineers. While this SOP does not provide guidelines for mitigation banking, it should be apparent that such measures could easily be added at some point in the future. Applicants should request a copy of the most recent guidelines regarding mitigation banking before developing proposals involving mitigation banking.

**11. Glossary.** The acronyms, abbreviations, and terms used in this document are in accordance with the definitions given in Charleston District Regulatory Branch'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* as used in this SOP means any adverse ecological effect on Waters of the United States including all filling, excavating, flooding, draining, clearing, or similar changes affecting U. S. Waters. Other categories of effects such as aesthetic, cultural, historic, health, etc., are not addressed by this SOP.

*Buffer zone* means an area designed to separate. As used in this SOP it refers to a defined area intended to separate and protect an aquatic area from upland development or adverse effects. If the buffer zone is protected by suitable restrictive covenants or similar measures then it may qualify as preservation in the calculation of mitigation credits.

*Compensatory mitigation* means compensating for the adverse effects by replacing or providing substitute resources or environments. Categories of compensatory mitigation for ecological effects include creation, restoration, enhancement, and preservation.

*Effect* is defined by Webster to mean something that inevitably follows an antecedent (as a cause or agent). The Council on Environmental Quality (CEQ) has defined 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:

- a. Direct effects, which are caused by the action and occur at the same time and place.
- b. Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

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 in this SOP.

*Mitigate*, as defined by Webster, means to cause to become less harsh or hostile, or to make less severe. The Council on Environmental Quality has defined at 40 CFR Part 1508.20 that *mitigation* includes the following:

- a. Avoiding the impact altogether by not taking a certain action or parts of an action.
- b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- c. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

e. Compensating for the impact by replacing or providing substitute resources or environments.

This SOP is limited to evaluation of compensatory mitigation plans for adverse ecological effects. Categories of mitigation other than compensation (e.g., avoidance, minimization, reduction) are not addressed by this SOP. Normally, before compensatory mitigation is considered, other categories of mitigation should be evaluated consistent with the sequencing requirements of the MOA between the CoE and EPA.

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

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

#### Acronyms and Abbreviations.

CoE	Corps of Engineers
DE	District Engineer
DHEC	S. C. Dept. of Health and Environmental Control
EPA	U. S. Environmental Protection Agency
FWS	U. S. Fish and Wildlife Service
MOA	Memorandum of Agreement
NMFS	National Marine Fisheries Service
NWP	Nationwide Permit
SAC	South Atlantic Division, Charleston District
SCCC	S. C. Coastal Council
SOP	Standard Operating Procedure
WMRD	S. C. Wildlife and Marine Resources Dept.
WRC	S. C. Water Resources Commission

**12. Signature Authority.** All letters regarding Mitigation Plans subject to this SOP will be signed at the appropriate authority level indicated below. Any letters which do not fall into one of the categories listed below shall be signed by the District Engineer or his designated representative.

12.1. *Routine Actions.* The following categories of letters regarding projects subject to this SOP are considered routine actions and may be signed by Project Managers except that any letter falling into a category listed under Articles 12.2 or 12.3, shall be signed by the authority level indicated in that article.

- a. Letters responding to requests for information.
- b. Letters responding to requests for delineations or verification of delineations.
- c. Letters requesting additional information from applicants.

12.2. *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 Permits Processing Section except that

any letter falling into a category listed under Articles 12.1 or 12.3, shall be signed by the authority level indicated in that article.

- a. Letters approving any mitigation plan.
- b. Letters resolving any enforcement action.

12.3. *Special Actions.* The following categories of letters regarding projects subject to this SOP are considered special actions and will be signed at the authority level indicated below.

a. All letters of denial or disapproval shall be signed by the District Engineer or his designated representative.

b. All letters authorizing or approving a mitigation plan after any resource agency has recommended that the mitigation plan be disapproved shall be signed by the District Engineer or his designated representative.

c. All letters imposing special conditions regarding a mitigation plan or modifications to a mitigation plan which the applicant has not agreed to shall be signed by the District Engineer or his designated representative.

d. All letters authorizing or approving a mitigation plan when the calculated proposed mitigation credits are less than the calculated required mitigation credits shall be signed at the level authorized in Article 5 of this SOP.

e. All letters authorizing or approving a mitigation plan when the proposed plan deviates significantly from the policies and guidance given in this SOP, excluding variances covered in 12.3.d, above, shall be signed by the District Engineer or his designated representative.

**13. Authorizing Signature.** By the signature given below, this SOP is authorized as official policy of the Charleston District Regulatory Branch.

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Clarence A. Ham, Chief  
Regulatory Branch  
Charleston District

## Definitions and Explanations of Adverse Affects Factors

Adverse Affects Factors	Options					
Dominant Effect	Fill 2.0	Drain 1.8	Dredge 1.6	Flood 1.4	Clear 1.2	Shade 1.0
Lost Values	Type A 2.0	Type B 1.8	Type C 1.6	Type D 1.4	Type E 1.2	Type F 0.5
Duration of Effects	2+ yr. 1.0	1-2 yr. 0.5	0-1 yr. 0.2	Seasonal 0.1		
Preventability	High 2.0	Medium 1.0	Low 0			

*Clear* means to remove unwanted growth or items.

*Draining* means any 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* material means any material used for the primary purpose of replacing an aquatic area with dry land or of changing the bottom elevation of a waterbody. The term does not include pollutants discharged primarily to dispose of waste.

*Flood* means to cover with an open-surface waterbody such as a lake or pond.

*Lost Value* categories are defined as follows:

*Type A* a. Swamps/Floodplains - Oak/Red Maple/Sweet Gum Dominated - PFO1C & wetter.  
b. Pocosin/Carolina Bays.  
c. All Emergent Marshes.

*Type B* Consists of Value Type A areas which have been heavily disturbed, by legal activities in the distant past.

*Type C* a. Swamps/Floodplains/Flats - Oak/Maple/Sweetgum Dominated - PFO/PSS1A.  
b. Pond pine/pitcher plant flats/savannahs.

*Type D* Consists of Value Type C areas which have been heavily disturbed, by legal activities in the distant past.

*Type E* a. Pine flatwoods - planted or natural - loblolly/slash pine dominated.  
b. Naturalized borrow pits.

*Type F* All other habitat types not categorized above.

*Preventability* is a subjective measurement of the degree to which the adverse effects could be prevented. Note well Article 2 of this SOP. This factor is intended primarily for Nationwide Permit mitigation. All Individual Permits must satisfy the 404(b)(1) guidelines regarding avoidance, minimization, etc. Preventability levels are defined as follows:

- a. *High* means there may be practicable, less damaging alternatives that satisfy the purpose of the project.
- b. *Medium* means there may be alternatives but it is unclear if they satisfy the project purpose or if they are practicable.
- c. *Low* means there are no known alternatives which satisfy the purpose, are practicable, and are less damaging.

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

*Shading* means to shelter or screen by intercepting radiated light or heat.

## Definitions and Explanations of Mitigation Factors

*Control* means the responsible party to which the preserved area is deeded. Related terms are:

- a. *Private* means a private individual or business enterprise.
- b. *POA* means a property owners association or other similar, formally chartered, non-profit organization.
- c. *Conservancy* means a qualified, experienced, and reputable non-profit conservation organization.

*Creation of wetlands* means the conversion of non-wetland habitat to wetland habitat. Wetland creation usually includes grading, providing a suitable substrate and establishment of appropriate vegetation.

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

*Hydrology*, as used in this SOP, means the properties, distribution, and circulation of water on the surface of the land, in the soil and underlying rocks. Related terms include:

a. *Natural hydrology* means the area's hydrology as it existed prior to the actions of modern man. Hydrology which has been restored to its natural state qualifies as natural hydrology. Examples of such restoration include filling ditches which drain the area or removing berms which prevent inundation.

b. *Created hydrology* means the permanent manipulation of the topography of the area resulting in an ecologically significant change in the hydrology of the area.

c. *Mechanical hydrology* means the employment of mechanical methods (e.g., pumps) to supply water to an area thereby causing an ecologically significant change in the hydrology of the area. (Caution - note well Article 7.7 of this SOP)

*In-kind Mitigation* means the replacement of the impacted aquatic site with one of the same plant community type (same species composition). However, if the new ecosystem is one which is generally regarded to be of higher value than the impacted ecosystem then the mitigation is considered in-kind for purposes of calculating mitigation credits. For example, if a wooded swamp habitat is to be filled or altered and it is replaced by restoration of a cleared and drained former wooded swamp area, this would constitute in-kind restoration.

*Location* means the site at which the mitigation will be performed. Related terms include:

- a. *On Site* means within the project boundaries and the impacted watershed.
- b. *Inside* means within the impacted watershed.
- c. *Outside* means outside of the impacted watershed.

*Maintenance* means any planned, expected, or required manipulation or action after completion of the monitoring period which is necessary to achieve the mitigation goal. Remedial or planned work during the monitoring period is not considered maintenance but is rather just a part of the mitigation work. Minimal (low level) maintenance includes weeding or removal of unwanted pest species. Moderate maintenance includes some replanting of the desired vegetation (<10% of the planted species). High level maintenance includes significant replanting (>10% of plantings), addition of soils, hydrology manipulation, or other actions. (Caution - note well Article 7.7 of this SOP)

*Monitoring* means the collection of field data to measure the success of a mitigation or restoration effort. It usually includes analysis of the data, and submittal of a comprehensive report containing the data, analyses, and a narrative discussion of the findings and conclusions.

*Net improvement* is a subjective evaluation by the Corps of the net level of enhancement of all affected functions and values of an aquatic site. Adverse effects, if any, caused by the enhancement must be considered in determining the net improvement.

*Out-of-kind Mitigation* means the replacement of an impacted aquatic site with one of a different plant community type (different species composition). However, if the new ecosystem is one which is generally regarded to be of higher value than the impacted ecosystem then the mitigation is considered in-kind for purposes of calculating mitigation credits. For example, if a wooded swamp habitat is to be filled or altered and the mitigation consists of grading an area and planting it in freshwater emergent marsh species, this would be out-of-kind.

## Definitions and Explanations of Mitigation Factors

*Preservation* means the conservation of an area to prevent its exploitation or destruction. In order to qualify for mitigation credit, all preservation areas must comply with the requirements of Article 7.1.

*Restoration* means actions taken to correct previous alterations which have either destroyed or seriously impaired the values and functions of an aquatic area. An example of restoration is the hydrological alteration followed by the planting of appropriate wetland vegetation in a bottomland hardwood area that had previously been converted to another use, such as agriculture or silviculture.

*Soil* means the upper layer of earth which may be dug or plowed and in which plants grow. Related terms include:

a. *Existing Suitable Soil* (E. S. S.) means the appropriate use of soils existing at the mitigation site or contiguous with the site and which have been determined to be of a proper type for the proposed mitigation.

b. *Transferred Suitable Soil* (T. S. S.) means the appropriate use of soils imported to the mitigation site from a non-contiguous location which have been determined to be of a proper type for the proposed mitigation.

c. *Unknown Suitability Soil* (U. S. S.) means use of a soil type or source that is of unproven or uncertain suitability for the proposed mitigation.

*Timing* means the point in time when the mitigation will be performed. Related terms include:

a. *Prior* means before the permitted impact occurs.

b. *Concurrent* means at the same time as the permitted impact.

c. *After* means subsequent to the permitted impact.

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

a. *Transplanted* means using natural vegetation from a site similar to the proposed completed mitigation site.

b. *Nursery* vegetation means the use of nursery stock.

c. *Natural* vegetation involves no planting and allows spontaneous revegetation.

Worksheet for Calculating  
Required Mitigation Credits

Table of Adverse Affect Factors \*

Factors	Options					
Dominant Effect	Fill 2.0	Drain 1.8	Dredge 1.6	Flood 1.4	Clear 1.2	Shade 1.0
Lost Values	Type A 2.0	Type B 1.8	Type C 1.6	Type D 1.4	Type E 1.2	Type F 0.5
Duration of Effects	2+ yr. 1.0	1-2 yr. 0.5	0-1 yr. 0.2	Seasonal 0.1		
Preventability	High 2.0	Medium 1.0	Low 0			

\* See Attachment A for definitions and clarification.

Required Mitigation Credits

	Dominant Effect	Lost Values	Duration of Effect	Preventability	Sum of r Factors	Area of Impact	R x AA
Area 1					R <sub>1</sub> =	AA <sub>1</sub> =	
Area 2					R <sub>2</sub> =	AA <sub>2</sub> =	
Area 3					R <sub>3</sub> =	AA <sub>3</sub> =	
Area 4					R <sub>4</sub> =	AA <sub>4</sub> =	
Area 5					R <sub>5</sub> =	AA <sub>5</sub> =	
Area 6					R <sub>6</sub> =	AA <sub>6</sub> =	
Area 7					R <sub>7</sub> =	AA <sub>7</sub> =	
Area 8					R <sub>8</sub> =	AA <sub>8</sub> =	
Area 9					R <sub>9</sub> =	AA <sub>9</sub> =	
Area 10					R <sub>10</sub> =	AA <sub>10</sub> =	

Total Required Credits \*\* = Sum of all (R x AA) =

\*\* Transfer to Row A on Sheet 6.

Worksheet for Calculating  
Creation Mitigation Credits

Table of Creation Mitigation Factors \*

Factors	Options			
Kind		Lake or Pond 0.1	Out of Kind 0.3	In Kind 0.6
Dominant Location		Outside 0.3	Inside 0.4	On Site 0.5
Timing		After 0.2	Concurrent 0.3	Prior 0.4
Soils	N. A. 0	U. S. S. 0	T. S. S. 0.1	E. S. S. 0.2
Hydrology	N. A. 0	Mechanical 0	Created 0.2	Natural 0.3
Vegetation	N. A. 0	Natural 0.1	Nursery 0.2	Transplant 0.3
Monitoring	N. A. 0	1-2 Years 0.2	2-5 Years 0.3	5+ Years 0.4
Maintenance	N. A. 0	Moderate 0	Low 0.1	None 0.4

\* See Attachment B for definitions and clarification.

N. A. = Not Applicable

Creation Mitigation Credits

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Kind						
Location						
Timing						
Soils						
Hydrology						
Vegetation						
Monitoring						
Maintenance						
Sum of m Factors	$M_1 =$	$M_2 =$	$M_3 =$	$M_4 =$	$M_5 =$	$M_6 =$
Mitigation Area	$A_1 =$	$A_2 =$	$A_3 =$	$A_4 =$	$A_5 =$	$A_6 =$
M x A =						

Total Creation Credits \*\* = Sum of all (M x A) =

\*\* Transfer to Row B on Sheet 6.

Worksheet for Calculating  
Restoration Mitigation Credits

Table of Restoration Mitigation Factors \*

Factors	Options			
Kind			Out of Kind 0.4	In Kind 0.7
Dominant Location		Outside 0.4	Inside 0.5	On Site 0.6
Timing		After 0.3	Concurrent 0.4	Prior 0.5
Soils	N. A. 0	U. S. S. 0.1	T. S. S. 0.2	E. S. S. 0.3
Hydrology	N. A. 0	Mechanical 0	Created 0.3	Natural 0.5
Vegetation	N. A. 0	Natural 0.2	Nursery 0.3	Transplant 0.4
Monitoring	N. A. 0	1-2 Years 0.3	2-5 Years 0.4	5+ Years 0.5
Maintenance	N. A. 0	Moderate 0	Low 0.1	None 0.5

\* See Attachment B for definitions and clarification.

N. A. = Not Applicable

Restoration Mitigation Credits

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Kind						
Location						
Timing						
Soils						
Hydrology						
Vegetation						
Monitoring						
Maintenance						
Sum of m Factors	M <sub>1</sub> =	M <sub>2</sub> =	M <sub>3</sub> =	M <sub>4</sub> =	M <sub>5</sub> =	M <sub>6</sub> =
Mitigation Area	A <sub>1</sub> =	A <sub>2</sub> =	A <sub>3</sub> =	A <sub>4</sub> =	A <sub>5</sub> =	A <sub>6</sub> =
M x A =						

Total Restoration Credits \*\* = Sum of all (M x A) =

\*\* Transfer to Row C on Sheet 6.

Worksheet for Calculating  
Enhancement Mitigation Credits

Table of Enhancement Mitigation Factors \*

Factors	Options			
Kind			Out of Kind 0.2	In Kind 0.5
Dominant Location		Outside 0.2	Inside 0.3	On Site 0.4
Timing		After 0.1	Concurrent 0.2	Prior 0.3
Net Improvements	N. A. 0	Low 0.1	Moderate 0.3	High 0.5
Monitoring	0-1 Years 0	1-2 Years 0.1	2-5 Years 0.2	5+ Years 0.3
Maintenance	N. A. 0	Moderate 0	Low 0.1	None 0.3

\* See Attachment B for definitions and clarification.

N. A. = Not Applicable

Enhancement Mitigation Credits

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Kind						
Location						
Timing						
Net Improvement						
Monitoring						
Maintenance						
Sum of m Factors	$M_1 =$	$M_2 =$	$M_3 =$	$M_4 =$	$M_5 =$	$M_6 =$
Mitigation Area	$A_1 =$	$A_2 =$	$A_3 =$	$A_4 =$	$A_5 =$	$A_6 =$
$M \times A =$						

Total Enhancement Credits \*\* = Sum of all (M x A) =

\*\* Transfer to Row D on Sheet 6.

Worksheet for Calculating  
Preservation Mitigation Credits

Table of Preservation Mitigation Factors \*

Factors	Options		
Kind	Out of Kind 0.1	Buffer Zone 0.2	In Kind 0.4
Dominant Location	Outside 0.1	Inside 0.2	On Site 0.3
Timing	After 0.1	Concurrent 0.2	Prior 0.3
Control	Private 0.1	POA 0.3	Conservancy 0.5

\* See Attachment B for definitions and clarification.

Preservation Mitigation Credits

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Kind						
Location						
Timing						
Control						
Sum of m Factors	$M_1 =$	$M_2 =$	$M_3 =$	$M_4 =$	$M_5 =$	$M_6 =$
Mitigation Area	$A_1 =$	$A_2 =$	$A_3 =$	$A_4 =$	$A_5 =$	$A_6 =$
$M \times A =$						

Total Preservation Credits \*\* = Sum of all (M x A) =

\*\* Transfer to Row F on Sheet 6.

Summary Worksheet for  
Mitigation Credits

		Credits	Totals
A	Required Mitigation Credit		
B	Mitigation Credits by Creation		
C	Mitigation Credits by Restoration		
D	Mitigation Credits by Enhancement		
E	Non-Preservation Mitigation Credits = B + C + D		
F	Mitigation Credits by Preservation		
G	Total Proposed Mitigation Credits = E + F		

The total Mitigation Credits (Row G) should be equal to or greater than the total Required Mitigation Credits (Row A) for the proposed mitigation to be acceptable. The other requirements given in the SOP must also be satisfied, e.g., Row E must be at least 50% of Row A, drawings must be in accordance with Article 9 of the SOP, etc.

If the answer to either of the questions below is no, then the proposed mix and/or quantity of mitigation is not acceptable and the plan should be revised or rejected, unless a variation is approved in accordance with Article 5 of this SOP.

	Yes	No
$PMC \geq RMC$ or in words Is Row G greater than or equal to Row A ?		
$PMC_{\text{Non-Preservation}} \geq \frac{1}{2} RMC$ or in words Is Row E greater than or equal to 50% of Row A ?		

Sample Case #1

The proposed activity includes clearing and direct fill of 1 acre of Type C forested wetlands for construction of a dam, clearing and inundation of 6 acres of Type C forested wetlands, and the construction of permanent access roads over 0.5 acres of Type D forested wetlands. The purpose of the project is to provide a reservoir for fire protection and recreation for a private residence. The applicant proposes to provide mitigation by restoration and preservation. The proposed mitigation consists of restoring 9.5 acres of drained, cleared silvicultural land to its natural state of forested wetlands and preservation of 3.5 acres of Carolina Bays by donation to a qualified conservancy. The plan includes a 3 year monitoring plan, restoration of the natural hydrology by filling drainage ditches, and transplanting vegetation from the impacted area to the restoration area. No maintenance will be required after the mitigation plan has been completed. The restoration site is adjacent to the proposed inundated area and the mitigation will be done concurrently with the proposed activity.

Required Mitigation Credits

	Dominant Effect	Lost Values	Duration of Effect	Preventability	Sum R	Impact Area AA	Product R x AA
Area 1	2.0	1.6	1.0	1.0	5.6	1.0	5.6
Area 2	1.4	1.6	1.0	1.0	5.0	6.0	30
Area 3	2.0	1.4	1.0	0.0	4.4	0.5	2.2

**Total Required Credits = 37.8**

Restoration Mitigation Credits

Kind	0.7
Location	0.6
Timing	0.4
Soils	0.2
Hydrology	0.5
Vegetation	0.4
Monitoring	0.4
Maintenance	0.5
<b>M = Sum of Factors</b>	<b>3.7</b>
<b>A = Mitigation Area</b>	<b>9.5</b>
<b>Credits = M x A</b>	<b>35.15</b>

Preservation Mitigation Credits

Kind	0.1
Location	0.2
Timing	0.3
Control	0.5
<b>M = Sum of Factors</b>	<b>1.1</b>
<b>A = Mitigation Area</b>	<b>3.5</b>
<b>Credits = M x A</b>	<b>3.85</b>

Summary of Mitigation Credits

Mitigation Category	Mitigation Credits
Preservation	3.85
Restoration	35.15
<b>Total Credits</b>	<b>39.0</b>

$$PMC \geq RMC$$

$$39.0 \geq 37.8$$

$$PMC_{\text{Non-Preservation}} \geq \frac{1}{2} RMC$$

$$35.15 \geq 18.9$$

Since the Total Proposed Mitigation Credits (39.0) are greater than the Total Required Mitigation Credits (37.8), and the credits for restoration are more than 1/2 of the required credits, 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 in compliance with the general guidelines for mitigation.

Sample Case #2

The proposed activity is construction of a road which crosses several wetland systems above the headwaters. The work will require landclearing and filling of 5 acres of Type C wetlands and 4 acres of Type E wetlands. The purpose of the project is to provide a public access roadway. The applicant proposes to provide mitigation by creation and preservation. The proposed mitigation consists of creating 16.4 acres of forested wetlands and preservation of 5 acres of emergent wetlands by donation to a qualified conservancy. The plan includes a 4 year monitoring plan, created hydrology by grading, and transplanting vegetation from the impacted area to the creation area. No maintenance will be required after the mitigation plan has been completed. The creation site is adjacent to the proposed filled area and the mitigation work will be done concurrently with the proposed activity.

Required Mitigation Credits

	Dominant Effect	Lost Values	Duration of Effect	Preventability	Sum R	Impact Area AA	Product R x AA
Area 1	2.0	1.6	1.0	1.0	5.6	5.0	28.0
Area 2	2.0	1.2	1.0	1.0	5.2	4.0	20.8

**Total Required Credits = 48.8**

Creation Mitigation Credits

Kind	0.6
Location	0.5
Timing	0.3
Soils	0.2
Hydrology	0.2
Vegetation	0.3
Monitoring	0.3
Maintenance	0.4
<b>M = Sum of Factors</b>	<b>2.8</b>
<b>A = Mitigation Area</b>	<b>16.4</b>
<b>Credits = M x A</b>	<b>45.92</b>

Preservation Mitigation Credits

Kind	0.1
Location	0.2
Timing	0.2
Control	0.5
<b>M = Sum of Factors</b>	<b>1.0</b>
<b>A = Mitigation Area</b>	<b>5.0</b>
<b>Credits = M x A</b>	<b>5.0</b>

Summary of Mitigation Credits

Mitigation Category	Mitigation Credits
Preservation	5.0
Creation	45.92
<b>Total Credits</b>	<b>50.92</b>

$$\begin{aligned}
 \text{PMC} &\geq \text{RMC} \\
 50.92 &\geq 48.8
 \end{aligned}$$

$$\begin{aligned}
 \text{PMC}_{\text{Non-Preservation}} &\geq \frac{1}{2} \text{RMC} \\
 45.92 &\geq 24.4
 \end{aligned}$$

Since the Total Proposed Mitigation Credits (50.92) are greater than the Total Required Mitigation Credits (48.8), and the credits for creation are more than 1/2 of the required credits, 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 in compliance with the general guidelines for mitigation.