

# CHAPTER TWELVE: COMPENSATORY MITIGATION

## Introduction

The purpose of this chapter is to describe the need for and use of compensatory mitigation within the context of regulatory review of proposed coastal development activities. This topic has purposefully been included in a separate chapter of this report to reflect NOAA National Marine Fisheries Services' view that compensatory mitigation is a process that is distinct and separate from impact avoidance and minimization. Only a cursory discussion of compensatory mitigation has been attempted in this report because of the complexity and depth that would be required to cover this topic. We have provided a list of websites and publications that the reader may want to refer to for more detailed discussion of compensatory mitigation.

Compensatory mitigation is a means of offsetting unavoidable impacts to natural resources. It cannot be stressed strongly enough that compensatory mitigation should not be considered until a thorough and exhaustive assessment of project alternatives that may be less environmentally damaging and options for avoiding and minimizing impacts has been completed, and all remaining impacts are "unavoidable." The term "unavoidable impacts" is used ubiquitously in environmental impact assessments developed to meet various requirements of the National Environmental Policy Act (NEPA), Clean Water Act (CWA), Magnuson-Stevens Fishery Conservation and Management Act (MSA), Fish and Wildlife Coordination Act, and other laws and regulations.

The MSA identified the continuing loss of marine, estuarine, and other aquatic habitats to be one of the greatest long-term threats to the viability of commercial and recreational fisheries. The consultation requirements of §305(b)(4)(A) of the MSA require that NOAA National Marine Fisheries Service provide recommendations, which may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on essential fish habitat (EFH), to federal or state agencies for activities that would adversely effect EFH.

According to NEPA regulations, environmental assessments and environmental impact statements must include a discussion of the means to mitigate adverse environmental impacts. However, according to NEPA guidance, the term "mitigation" includes avoidance and minimization in addition to compensatory mitigation, and NEPA does not strictly require agencies to first avoid and minimize before utilizing compensatory mitigation to offset adverse effects. NEPA regulations do, however, require agencies to assess and discuss the environmental effects of all reasonable alternatives, including the means to mitigate any adverse effects.

The Federal CWA 404(b)(1) guidelines prohibit the discharge of dredge or fill material in waters of the United States if there is a practicable alternative. The 404(b)(1) guidelines also require that all waters of the United States will be accorded the full measure of protection under the CWA, including the requirements for appropriate and practicable mitigation. "Appropriate" is based on the values and functions of the aquatic resource that will be impacted, and "practicable" is defined as that which is available and capable of being done after taking into consideration the cost, existing technology, and logistics in light of overall project purposes. The Memorandum of Agreement (MOA) between the US Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines states, "Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required." This MOA established a three-part sequential process to help guide mitigation decisions, which includes: (1) avoidance – adverse impacts are to be avoided and no discharge shall be permitted if there is a practicable alternative with less adverse impact; (2) minimization – if impacts cannot be

avoided, appropriate and practicable steps to minimize adverse impacts must be taken; and (3) compensation – appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain (USDOA and USEPA 1989).

The need for exhausting all practicable alternatives to avoid and minimize adverse impacts prior to consideration of compensatory mitigation is necessary because of the inherent risks associated with compensatory mitigation. Establishing (creating), reestablishing (restoring), and rehabilitating (enhancing) degraded wetlands and/or aquatic habitats have inherent risks. Replicating or restoring the physical and chemical characteristics of fishery habitat, including soil/sediment hydrology and chemistry, hydrologic connections, and water quality are complex undertakings and can require years to achieve desired results. Replicating and restoring the full ecological functions and values of fishery habitat may not occur without additional effort and cost, and there are no assurances of success. In addition, evaluating mitigation performance and success can require considerable pre- and postconstruction monitoring and assessment, which can be time consuming and costly. For these and other reasons, compensatory mitigation should be viewed as a “last resort” option to achieve effective mitigation, with avoidance and minimization of impacts being the initial focus during the impact assessment process.

Once all practicable alternatives have been considered satisfactorily and a least damaging practicable alternative has been selected that effectively avoids and minimizes adverse effects to the maximum extent practicable, measures to offset unavoidable impacts should be assessed and utilized. Compensatory mitigation can be accomplished on-site or off-site (i.e., in relation to the area being impacted) and can either be in-kind or out-of-kind (i.e., compensation with the same or different ecological functions and values). Generally, in order to achieve the functional replacement of the same or similar ecological resources, in-kind should be considered over out-of-kind compensatory mitigation. However, compensatory mitigation decisions are often made in the context of landscape and watershed implications, as well as logistical and technological limitations. Out-of-kind mitigation, should it be considered, should provide services of equal or greater ecological value and should only be employed if in-kind mitigation is deemed impracticable, unfeasible, or less desirable in the watershed context. However, replacing lost or degraded tidal wetlands or other intertidal/subtidal habitats with nontidal (e.g., freshwater) wetlands should not occur.

Compensatory mitigation can be broadly categorized as restoration, creation, enhancement, and preservation (USACE 2002). Restoration includes reestablishment of a wetland or other aquatic resource with the goal of returning natural or historic functions and characteristics to a former or degraded habitat. Restoration may result in a net gain in ecological function and area. Creation or establishment consists of the development of a wetland or other aquatic resource through manipulation of the physical, chemical, or biological characteristics where a wetland did not previously exist. Creation results in a net gain in ecological function and area. Enhancement or rehabilitation includes activities within existing wetlands that heighten, intensify, or improve one or more ecological functions. Enhancement may result in improved ecological function(s), but does not result in a gain in area. Preservation is designed to protect important wetland or other aquatic resources into perpetuity through implementation of appropriate legal and physical mechanisms (i.e., conservation easements, title transfers). Preservation may include protection of upland areas adjacent to wetlands or other aquatic resources. Preservation does not result in a net gain of wetland acres or other aquatic habitats and should only be used in exceptional circumstances. Preservation is best applied in conjunction with restoration and/or enhancement of ecological functions and values and rarely as the sole means of compensation.

Compensatory mitigation can be provided in the form of project-specific mitigation, mitigation banking, or in-lieu fee mitigation (USEPA 2003). Project-specific mitigation is

generally undertaken by a permittee or agency in order to compensate for resource impacts resulting from a specific action or permit. The permittee or agency performs the mitigation and is ultimately responsible for implementation and success of the mitigation. Mitigation banking is a wetland area that has been restored, created, or enhanced, which is then set aside (“banked”) to compensate for future impacts to wetlands or other aquatic resources. The value of a bank is determined by quantifying the resource functions restored or created in terms of “credits,” which can be acquired, upon the approval of regulatory agencies, to meet a project’s requirements for compensatory mitigation. The bank sponsor is ultimately responsible for the success of the project. In-lieu fee mitigation involves a program where funds are paid to a natural resource management entity by a permittee or agency to meet their requirements of compensatory mitigation. The fees are used to fund the implementation of either specific or general wetland or other aquatic resource conservation projects. The management entity may be a third party (e.g., nongovernmental organizations, land trusts) or a public agency that specializes in resource conservation, restoration, and enhancement programs.

Below are some general topics and recommendations regarding the assessment and implementation of compensatory mitigation for actions that may adversely affect fishery resources. It may be necessary to include some of these measures as permit conditions or in decision documents in order to ensure that compensatory mitigation is completed satisfactorily and within the agreed upon timeframes.

### ***Baseline information***

The primary purpose of providing effective compensatory mitigation should be to restore or replace the ecological functions and values of resources. In order to assess the effectiveness of compensatory mitigation, the baseline or existing functions and values of the project impact site must be known, as well as the target functions and values for the completed compensatory mitigation site. This can only be accomplished through site-specific monitoring and resource assessments. There are a number of assessment methodologies available to accomplish this, and it is important to determine the method(s) that should be used in advance because it will be necessary for the performance evaluation of the completed mitigation site.

Generally, compensatory mitigation should be provided for direct and indirect impacts, as well as short-term, long-term, and cumulative impacts to fishery resources. Indirect, long-term, and cumulative impacts of a development project may be more difficult to identify and quantify than short-term impacts, but they are no less important. In some cases, the adverse effects on aquatic resources from indirect, long-term, and cumulative impacts may be greater than the direct, short-term construction-related impacts. For example, the direct construction-related impacts of deepening a navigation channel for the purpose of expanding a commercial marina may only involve the removal of bottom sediments in the existing channel. Even so, the dredging project may also result in other short-term impacts to benthic resources from sedimentation and turbidity and anchor damage from vessels. Expansion of a marina operation may result in long-term and cumulative impacts to seagrass and riparian vegetation from vessel wakes and prop scour and in chronic turbidity and sedimentation from larger and more frequent vessel activity. Long-term and cumulative impacts from a development project may also determine whether compensatory mitigation is more appropriately located on-site or off-site.

### ***Compensatory mitigation plan***

A clear and concise description of the specific habitats and the functions and values that are intended to be restored should be provided in the mitigation plan. Wetlands and other aquatic

habitats provide numerous functions and values within an ecosystem, so it is important to identify the specific functions and values that the compensatory mitigation is intended to restore or replace. Performance criteria should be established (e.g., 80% vegetation cover by target species by the end of the second growing season), and specific monitoring and analytical methods to assess the success of the mitigation should be stipulated in advance.

Adaptive management should be incorporated into mitigation plans, when appropriate. While clear and concise performance criteria are important in all compensatory mitigation plans, monitoring data and predetermined ecological indicators should be used to guide the progress of the mitigation and ensure mitigation objectives are met. Effective compensatory mitigation plans should recognize the importance of adaptive management and allow for corrective action when performance measures are not being met.

A compensatory mitigation plan should include requirements for monitoring and performance reporting, including the content and frequency of reports and who should receive the reports. Generally, the reports should be provided concurrently with the completion of performance monitoring to allow for corrective actions to be taken should success criteria not be met. Other features of a mitigation plan may include measures to ensure mitigation site protection, financial assurances, and a description of long-term maintenance requirements, if necessary, and the party or parties responsible for completing the mitigation requirements.

### *Contingency plans*

Contingency plans for the mitigation plan may be necessary to ensure that adequate compensation is provided, particularly for mitigation that is considered a high-risk endeavor, such as restoration of eelgrass beds. The contingency plan may be necessary to extend the completion of the mitigation plan, and it may require supplemental effort (e.g., planting) or call for alternative mitigations (e.g., out-of-kind). If it is determined that mitigation contingencies are necessary, they should be specified in the permit or decision documents.

### *Mitigation timing*

To minimize the time lag between the loss of wetlands or other aquatic resources and the completion of the compensatory mitigation project, implementation of mitigation construction should begin as soon as possible. For example, if mitigation construction must begin during a specific time of year or the ecological functions and values at the mitigation site require multiple years before being realized, it may be desirable for the compensatory mitigation project to begin before the resource impacts occur.

### *Interim losses*

In situations where there will be delays in implementation of compensatory mitigation or a compensatory mitigation project requires several years to complete, interim or temporal losses of ecological functions and values may be substantial. In these cases, compensation of the interim losses of ecological functions and values should be included in the compensatory mitigation plan. There are a number of ways in which compensation of interim losses can be assessed, such as increasing the ratio of acreage lost to acreage replaced. However, “loss of services” analyses, such as the Habitat Equivalency Analysis (HEA), have been used successfully in a number of restoration projects (NOAA 2006). The HEA assumes there is a one-to-one tradeoff between the resource services at the compensatory restoration site and the resource impact site. In other words, it assumes that the resources can be compensated for past losses through habitat replacement projects

providing the replacement resources are the same type as the lost or damaged resources (i.e., in-kind mitigation).

For more information and a more detailed discussion about compensatory mitigation, the reader may refer to the following resources.

***General compensatory mitigation guidelines***

<http://www.epa.gov/wetlandsmitigation>

<http://www.epa.gov/owow/wetlands/guidance>

[http://www.nap.usace.army.mil/cenap-op/regulatory/draft\\_mit\\_guidelines.pdf](http://www.nap.usace.army.mil/cenap-op/regulatory/draft_mit_guidelines.pdf)

[http://www.mitigationactionplan.gov/Preservation\\_8-27-04.htm](http://www.mitigationactionplan.gov/Preservation_8-27-04.htm)

***Mitigation banking and in-lieu fee programs***

<http://www2.eli.org/wmb/backgroundb.htm>

<http://www.gao.gov/new.items/d01325.pdf>

***Habitat equivalency analysis***

<http://www.csc.noaa.gov/coastal/economics/habitatequ.htm>

<http://www.darrp.noaa.gov/library/pdf/heaoverv.pdf>

## References for Compensatory Mitigation

- [NOAA] National Oceanic and Atmospheric Administration. 2006. Habitat equivalency analysis: an overview. [Internet]. Washington (DC): US Department of Commerce, NOAA, Damage Assessment and Restoration Program.[cited 2008 Jul 28]. 24 pp. Available from: <http://www.darrp.noaa.gov/library/pdf/heaoverv.pdf>
- [USACE] US Army Corps of Engineers. 2002. Guidance on compensatory mitigation projects for aquatic resource impacts under the Corps regulatory program pursuant to Section 404(a) of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. [Internet]. Washington DC): USACE. Regulatory Guidance Letter No. 02-2, 2002 Dec 24. [cited 2008 Jul 28]. Available from: <http://www.usace.army.mil/cw/cecwo/reg/rgls/RGL2-02.pdf>.
- [US Army], [USEPA] US Department of the Army, US Environmental Protection Agency. 1989. Memorandum of agreement between the Department of the Army and the Environmental Protection Agency concerning the determination of the Section 404 Program and the application of the exemptions under Section 404(F) of the Clean Water Act. [Internet]. Washington (DC): US Army and US EPA. [cited 2008 Jul 28]. Available from: <http://www.usace.army.mil/cw/cecwo/reg/mou/404f.htm>.
- [USEPA] US Environmental Protection Agency. 2003. Wetlands compensatory mitigation. [Internet]. Washington (DC): US EPA, Office of Wetlands, Oceans, and Watersheds. EPA Report EPA-843-F-03-002. [cited 2008 Jul 28]. Available from: <http://www.epa.gov/owow/wetlands/pdf/CMitigation.pdf>.