US Army Corps of Engineers®

REGULATORY GUIDANCE LETTER

No. 18-01 Date: 25 September 2018

SUBJECT: Determination of Compensatory Mitigation Credits for the Removal of Obsolete Dams and Other Structures from Rivers and Streams.

1. Purposes, Applicability, and Definitions

Purposes. The U.S. Army Corps of Engineers (Corps) has the authority to issue permits under Section 404 of the Clean Water Act and Sections 9 and 10 of the Rivers and Harbors Act of 1899. Under 33 CFR 320.4(r) and 33 CFR 330.1(e)(3), the Corps may require that these Department of the Army (DA) permits include compensatory mitigation to offset unavoidable impacts to waters of the United States. Compensatory mitigation can be provided through restoration activities that improve the physical, chemical, and biological processes performed by rivers and streams with the goal of returning the natural/historic functions performed by those rivers and streams. The removal of obsolete dams and other obsolete in-stream structures can be an effective approach to restoring river and stream structure, functions, and dynamics. These restoration activities may be performed by mitigation banks and in-lieu fee programs to generate mitigation credits that can be sold or transferred to permittees to fulfill compensatory mitigation requirements in DA permits. These restoration activities can also be conducted as permittee-responsible mitigation. The regulatory requirements for compensatory mitigation by mitigation banks, in-lieu fee programs, and permittee-responsible mitigation are provided in 33 CFR Part 332.

This document provides guidance to district engineers on: 1) factors they should consider when determining the amount of mitigation credit generated from the removal of obsolete dams or other structures; 2) recommendations for quantifying mitigation credits; and 3) recommendations for the treatment of losses of wetland that result from the removal of dams and other structures. This guidance covers aspects of these restoration activities that are not explicitly addressed by the compensatory mitigation regulations at 33 CFR Part 332.

Applicability. This guidance applies to compensatory mitigation projects to restore river and stream structure, functions, and dynamics that involve the removal of obsolete dams and other structures, including the removal or replacement of undersized or perched culverts. This guidance also applies to compensatory mitigation projects that involve the removal of dams or other structures that are still fulfilling their intended purpose(s), but are proposed to be removed to restore river and stream structure, functions, and dynamics. Corps Headquarters will provide a training webinar to Corps district staff within several weeks of the date this Regulatory Guidance Letter was issued.

This guidance does not apply to previously authorized mitigation banks, in-lieu fee projects, or permittee-responsible mitigation projects, or to compensatory mitigation proposals that were received before the date this guidance was issued. It only applies to compensatory mitigation proposals involving the removal of obsolete dams and other structures, and applies to proposals that were received by the district engineer after the date this Regulatory Guidance Letter was issued. This guidance does not affect how and when the Corps determines compensatory mitigation requirements of a permit action.

Definitions. For the purposes of this guidance, the term “stream” means both rivers and streams and the phrase “removal of obsolete dams and other structures” applies to: (1) the removal of obsolete dams and other obsolete or degraded man-made structures, (2) the removal of undersized or perched culverts, and (3) the replacement of undersized or perched culverts with bridges or culverts that improves stream functions, including the movement of water, sediment, and aquatic organisms.

This guidance is based on regulations that contain legally binding requirements. This guidance is not a substitute for those regulations, does not create legally binding requirements, and is not a regulation itself. It does not impose legally binding requirements on the Corps, mitigation providers, or permittees, and may not apply to every situation. The Corps retains the discretion to adopt approaches on a regional or case-by-case basis that differ from those provided in this guidance as appropriate and consistent with statutory and regulatory requirements.

2. Background

Streams and their associated riparian areas and floodplains provide a variety of functions including hydrologic functions, nutrient cycling functions, food web support, and corridors for movement of aquatic organisms. Riparian areas and floodplains next to streams are also an integral part of stream ecosystems and play critical roles in stream functions. According to the U.S. Army’s Engineer Research and Development Center, streams and their riparian areas/floodplains perform five broad categories of functions (see the Engineer Research and Development Center report entitled “Functional Objectives for Stream Restoration” (ERDC TN-EMRRP SR-52 (2006))[1]:

[1] Available at:
http://acwc.sdp.sirsi.net/client/en_US/default/index.assetbox.assetactionicon.view/1004313?rm=ECOSYSTEM+MANA0%7C%7C%7C1%7C%7C%7C0%7C%7C%7Ctrue

- Stream system dynamics
- Hydrologic balance
- Sediment processes and character
- Biological support
- Chemical processes and landscape pathways

Many streams in the continental United States are altered by dams of various sizes. According to the National Inventory of Dams (http://nid.usace.army.mil/cm_apex/f?p=838:12), in 2016 there were 90,580 dams in the United States. In addition, there are approximately one to two million small dams in the United States that do not meet the criteria necessary to be included in the National Inventory of Dams. Many of these dams were built in the 19th century and have deteriorated, been abandoned, or otherwise no longer fulfill their intended purpose but continue to impair the structure, functions, and dynamics of streams.

Undersized and perched culverts also impair the structure, functions, and dynamics of streams. Since such undersized and perched culverts may increase the risk of upstream flooding, they can potentially endanger the people and other living things in the vicinity of those streams, and potentially damage property and ecological resources.

Effects of dams and other obstructions on streams. Dams and other obstructions adversely affect stream functions by altering the stream's hydrologic, sediment transport, and nutrient cycling processes. These effects can result in changes to species composition, the structure and dynamics of streams (and their associated riparian areas/floodplains), water temperatures, and dissolved oxygen levels. They also act as barriers to upstream and downstream movements of fish and other aquatic organisms. Dams and other obstructions disrupt the sediment transport that is critical to sustaining the habitat of riverine and riparian species, including the variations in sediment sizes that are important for habitat heterogeneity for different life stages of aquatic organisms. Stream reaches immediately downstream of a dam or other obstruction become starved of sediment which can lead to stream bank erosion or channel incision. In coastal areas, disruption of sediment transport by dams can contribute to the loss of shoreline habitats because of reduced sediment deposition in those areas. Dams and other obstructions often convert an ecosystem with flowing water (e.g., a stream) to an ecosystem with still water (e.g., a lake). Changing the hydrology from flowing to still water alters the species composition of those waters, from species that prefer flowing water to species that favor still waters. The higher water temperatures in an impoundment may act as a thermal barrier that prevents certain species from migrating upstream. Dams and other obstructions prevent or impair the ability of aquatic organisms to move throughout the stream network to feed, reproduce, and perform other activities necessary for their survival and persistence. Dams and other obstructions can affect the flooding regimes of streams, and alter the ecological processes that occur in floodplains, and adversely affect species that rely on that periodic flooding. These effects usually persist as long as the dam or other obstruction is in place.

Effects of removing dams and other obstructions from streams. Removing dams and other obstructions can, to a substantial degree, reverse the impacts of those structures on riverine systems, including the structure, functions, and dynamics of streams and their riparian areas/ floodplains. Removing obsolete dams and other structures can thus help support the objective of the Clean Water Act by restoring physical, chemical, and biological processes performed by streams. The removal of obsolete dams and other structures can provide a number of benefits including, in particular the restoration of stream functions. Restoring stream functions can then lead to more natural river flows, increased connectivity within the stream network, and the re-establishment of migratory routes and habitats for aquatic organisms. The removal of dams also helps improve public safety for the users of small craft such as canoes and kayaks and for local residents that might be adversely affected when an old or deteriorated dam structure fails. The removal of obsolete dams and other structures also can have adverse effects on the aquatic environment, including the disturbance caused by machinery working in or near the stream, the blanketing of downstream habitat by newly released sediments from behind the dam or obstruction, and, in some cases, long-term contamination from pollutants in those sediments. Best management practices can be implemented to avoid or minimize these adverse environmental effects. Most of the adverse effects from removing dams and other obstructions are short-term, and are eventually supplanted by the long-term restoration of stream structure, function, and dynamics.

After a dam has been removed, the stream re-establishes a channel by eroding sediment that had accumulated upstream of the dam structure. A riparian area/floodplain may be established in adjacent sediments next to the re-established stream channel in the former impoundment. Wetlands may develop in the new floodplain or in riparian areas that are periodically inundated by the restored stream hydrology. In the former impoundment, species composition may change from those that prefer to live in still water to those that prefer to live in flowing water.

The rate of recovery from dam removal depends on a variety of interacting factors, such as hydrology, impoundment size, sediment volume, sediment grain size, watershed condition, life history of species inhabiting the stream and adjacent habitats, and the history of the stream. The amount of time it takes streams to recover their physical, chemical, and biological attributes following the removal of obsolete dams and other structures varies, but the initial response rate is often fairly rapid, especially for hydrology and sediment transport. Recovery of physical attributes often occurs within years rather than decades. Species recovery rates are highly variable, and generally vary by taxa, with some species requiring many years to become re-established, if they ever do become re-established.

3. Discussion

This guidance provides direction to district engineers on factors to consider when determining the number of mitigation credits produced by the removal of obsolete dams and other structures to restore stream structure, functions, and dynamics. A district engineer may identify additional factors for determining mitigation credits generated by these restoration activities if he or she determines those additional factors are appropriate for the region. District engineers are encouraged to develop local credit determination methodologies for these types of restoration activities, and to seek public input during the development of local credit determination methods. In the meantime, district engineers can continue to review proposals for these types of restoration activities and lessons learned from those reviews can inform the development of local credit determination methods.

Because stream structure, function, and dynamics vary by region and regional priorities may differ for species recovery and management, resource restoration and protection, and the provision of ecosystem services, districts are encouraged to develop their own guidelines for quantifying mitigation credits generated by the removal of obsolete dams and other structures.

The removal of obsolete dams and other structures can have positive and negative environmental effects. Generally, there will be short-term adverse environmental effects and long-term beneficial environmental effects. The beneficial and adverse environmental effects caused by these activities can vary depending a variety of factors, such as site conditions, watershed characteristics, historic and present land uses, and how the obsolete dam or other structure will be removed. This document does not provide guidance on evaluating the potential adverse environmental effects that may be caused by the removal of an obsolete dam or other structure, or the avoidance, minimization, and compensation measures that may be necessary to reduce those potential adverse environmental effects to comply with applicable regulations. Evaluations of potential adverse environmental effects, and the identification of appropriate minimization measures, need to be conducted on a case-by-case basis as part of the permit evaluation process or the review of a proposed mitigation plan. If the removal of an obsolete dam is authorized by Nationwide Permit 53, the evaluation of the potential adverse environmental effects and identification of appropriate minimization measures will be conducted during the review of the pre-construction notification. The removal of other obsolete structures may be authorized by other nationwide permits or by regional general permits. If the removal of an obsolete dam or other structure requires an individual permit under Section 404 of the Clean Water Act, the analysis provided pursuant to 404(b)(1) Guidelines should evaluate the beneficial and adverse environmental effects.

4. <u>Guidance</u>

A. Credit Determinations

According to the Corps' regulations at 33 CFR 332.2, a mitigation credit represents "the accrual or attainment of aquatic functions at a compensatory mitigation site." Per that same regulation, the number of mitigation credits should be based on increases in ecological functions that will be present or are expected to occur when the compensatory mitigation project achieves its objectives. Most ecosystem restoration activities result in short term adverse environmental effects during the removal of structures or fills or other stressors that impair ecosystem functions, with the expectation that there will be long-term improvements to the restored aquatic ecosystem (e.g., net gains in functions that produce mitigation credits). Mitigation credit determinations should be based on the longer-term net gains in functions that result from the restoration activity as opposed to short-term adverse effects. Because of the inherent variability and uncertainty in stream response to the removal of dams or other obstructions, monitoring is extremely important. While mitigation credits can be determined prior to fully achieving the longer-term net gains in ecological functions, monitoring should be required in order to demonstrate that the expected functional gains are realized, and are likely to persist. See 33 CFR 332.5 for the requirements for monitoring of compensatory mitigation projects.

Environmental and watershed conditions have a strong influence on stream structure, functions, and dynamics. When evaluating potential credit production resulting from the removal of an obsolete dam or other structure, it is important to consider environmental and watershed changes that occurred after the dam or other structure was originally constructed, and how those changes affect the recovery potential for the structure, functions, and dynamics of the stream. When setting objectives for the compensatory mitigation project, the stream should not be expected to recover to a historic ecological state that existed prior to the construction of the dam or other structure because environmental and watershed conditions have likely changed since that dam or other structure was originally constructed. After the removal of the impairment caused by the dam or other structure, the stream should recover structure, functions, and dynamics that reflect contemporary environmental and watershed conditions. Nevertheless, it is likely that this recovery will result in increases in the physical, chemical, and biological functions performed by the stream that generate mitigation credits.

If an appropriate functional or condition assessment is available to quantify the number of mitigation credits produced by the removal of an obsolete dam or other structure, that assessment method should be used. If an appropriate functional or condition assessment is not available, then the guidance below may be used as a surrogate to determine the number of mitigation credits produced. Regardless of the approach used to quantify mitigation credits, the number of credits should reflect the difference between the amount of aquatic resource functions performed by the stream and any associated riparian areas/floodplains/riverine wetlands prior to removal of the obsolete dam or other structure and the amount of aquatic resource functions performed by the stream and any associated riparian areas/floodplains/riverine wetlands after the structure is removed.

(1) Areas Considered for Credit Production. The following areas should be considered for credit production through the removal of obsolete dams and other structures:

(i) *Area of the river or stream channel that physically responds to the removal of the obsolete dam or other structure*. One factor for determining the number of mitigation credits generated by the removal of obsolete dams or other structures should be the area of stream bed that recovers from the removal of the structure and exhibits geomorphic adjustments as a result of restoration of natural hydrologic and sediment regimes. The stream bed where the structure is removed and the stream segments upstream and downstream of that site should both be considered for credit production. The district engineer should identify the locations where the stream channel physically changes due to the removal of the dam or other structure on a case-by-case basis because the stream's responses to the removal of the obsolete dam or other structure will depend on a variety of factors. These factors include, but are not limited to, stream geomorphology, sediment grain size, channel slope, stream hydrology and hydrodynamics, watershed characteristics, impoundment size, the physical characteristics of the structure to be removed (e.g., low-head dam versus storage dam), and proximity to other dams and obstructions.

Generally, the upstream segment that generates mitigation credit would be the stream channel that becomes re-established in the former impoundment plus any additional stream channel that is expected to undergo adjustments in channel geomorphology in response to the removal of the structure. The downstream segment that generates mitigation credit should include the stream channel that is likely to exhibit appreciable adjustments in stream geomorphology after the obsolete dam or other structure has been removed and stream hydrology and sediment transport processes have been restored. For example, after the structure is removed, sediment may accumulate (aggrade) in areas of the stream that were scoured by water flows passing over or through the structure, thus restoring stream bed sediment characteristics in that stream segment. District engineers can estimate the area of the downstream segment where recovery of stream bed sediment characteristics and other applicable stream channel adjustments will occur after removal of the obsolete dam or other structure. Factors affecting that area include the quantity of sediment in the former impoundment, sediment grain size, and the stream's capacity for transporting sediment. District engineers can develop regionally appropriate measures and metrics to monitor and assess physical recovery and evaluate whether the expected credits have been generated from the removal of the obsolete dam or other structure.

(ii) *Restoration, enhancement, or protection/preservation of riparian areas*. Stream restoration projects should include, where practicable, the restoration, enhancement, and/or preservation of riparian areas/floodplains next to the restored stream reaches because riparian areas/floodplains are critical to the ecological functioning of streams. After the removal of an obsolete dam or other structure, additional riparian areas and floodplains may develop in the former impoundment after the stream channel re-establishes itself depending on the size of the impoundment that existed when the structure was in place, topography, hydrology, sediment characteristics, and other factors. Riparian areas and floodplains restored, and/or enhanced in conjunction with the removal of other types of obsolete structures, including perched or undersized culverts, should be granted mitigation credit if they are included in the approved mitigation plan (33 CFR 332.3(i)).

(2) Considerations for Crediting. District engineers can develop additional factors to determine the amount of mitigation credits generated by the removal of the obsolete dam or other structure. Examples of potential factors are provided below. Not all of these factors will be appropriate for every project, and calculation of credit totals based on these factors should only occur after monitoring has demonstrated that the anticipated benefit has been obtained.

(i) Endangered and/or threatened species. The removal of obsolete dams and other structures can contribute to the recovery of species listed as endangered and/or threatened under the Endangered Species Act of 1973 by improving their ability to move upstream and downstream of the removed structure and access habitats previously impeded by the structure. A district engineer may adopt a crediting factor for assisting the recovery of the threatened and/or endangered species. Such a factor should be based on the improved use of habitat by target species resulting from the removal of the obsolete dam or other structure, rather than the distance of upstream habitat that can be reached after the obsolete structure is removed. Ecological performance standards for credit releases should be based on the attainment of performance standards that correspond to specific habitat functions (e.g., salmonid spawning and rearing habitat) as well as observations that individuals of an endangered and/or threatened species are using the habitat on a regular basis. Ecological performance standards should also take into account the fact that some species may inhabit newly opened habitat quickly (e.g., days to months) while other species may require years to inhabit newly accessible habitats. Mitigation credits could be granted on the condition that subsequent monitoring validates the “regular use” of the restored habitat. Mitigation credit should not be granted for all the tributaries upstream of the site of the former dam or other structure that become accessible to these species after removal of that structure, but the value of this crediting factor should be proportional to the geographic extent of all tributaries with suitable habitat that is being used by listed species.

(ii) Diadromous fish. The removal of obsolete dams and other structures can support federal and state goals for the recovery of diadromous fish in targeted watersheds. A district engineer may adopt a crediting factor for diadromous fish recovery using a similar rationale as the crediting factor described above for endangered and/or threatened species. The crediting factor should be based on the attainment of performance standards that correspond to specific habitat functions (e.g., diadromous fish spawning and rearing habitat) as well as observations that individuals of a diadromous species are using the habitat on a regular basis. Mitigation credits could be granted on the condition that subsequent monitoring validates the "regular use" of the restored habitat. Mitigation credit should not be granted for all the tributaries upstream of the site of the former dam or other structure that become accessible to these species after removal of that structure, but the value of this crediting factor should be proportional to the geographic extent of all tributaries with suitable habitat that is being used by diadromous species.

(iii) Improvements in stream habitat, including water quality. The removal of obsolete dams and other structures can improve various components of streams and their riparian areas/floodplains all of which should be considered when calculating mitigation credit. For example, the removal of obsolete dams and other structures can improve water quality through the restoration of water temperature regimes and dissolved oxygen levels. As discussed above, restoration of sediment transport processes may also improve stream habitat quality and connectivity for other species, thereby improving the biological functions of streams. Another example of a potential factor for generating mitigation credit is restoring the flow regime of the stream, and the subsequent replacement of non-native species that inhabited the still waters of the impoundment with native species that inhabit flowing waters. Improvements in stream habitat and water quality will likely vary in accordance with the restoration potential of the stream, which is dependent on watershed condition and other factors. For this crediting factor, examples of ecological performance standards for credit releases could be based on observed improvements in water quality, hydrologic data demonstrating restoration of the stream's flow regime, geomorphic data demonstrating recovery of sediment transport processes and stream bed sediment characteristics, and observations of changes in species composition from species that inhabit still waters to species that inhabit flowing waters after removal of the obsolete dam or other structure.

(iv) Distance to the next in-stream obstruction. A district engineer should consider whether the upper or lower limit of the stream that generates compensatory mitigation credit as a result of removal of an obsolete dam or other structure may be affected by the presence of another upstream or downstream obstruction or other significant channel modification that limits the stream's ecological recovery. These obstructions may be other dams or culverts located elsewhere on the stream that impair riverine structure, functions, and dynamics.

(v) Other crediting factors. District engineers can identify other factors that should be used for determining the amount of mitigation credit generated by the removal of obsolete dams and other structures. Those factors should be clearly explained in district compensatory mitigation credit calculators, standard operating procedures, or similar documents so that they are transparent to mitigation providers.

B. Long term protection

The Corps mitigation regulations at 33 CFR 332.7(a)(1) require long-term protection of the mitigation site through real estate instruments or other available mechanisms, as appropriate. The preamble to the 2008 mitigation rule (73 FR 19646) recognizes that in-stream rehabilitation measures may not warrant long-term protection and states that the district engineer will consider the characteristics of the compensation mitigation activity and the real estate interests of the mitigation project proponent. Securing these real estate interests can be difficult since stream beds where dams and other structures are located may be publicly-owned (e.g., state lands) or privately-owned. If, as part of the mitigation plan, the mitigation provider is proposing to generate additional mitigation credit through the restoration, enhancement, or protection of riparian areas/floodplains next to the stream reaches to be restored by the removal of the obsolete dam or other structure, these areas should be provided long-term protection, as appropriate.

C. Quantifying Compensatory Mitigation Credits for the Removal of Obsolete Dams and Other Structures

District engineers have the discretion to require mitigation credits to be quantified as acres, linear feet, functional assessment units, or other suitable metrics of particular resource types (see 33 CFR 332.3(f)(1) and 33 CFR 332.8(o)(1)). While the regulatory text does not direct this point specifically, the preamble to the 2008 mitigation rule states that the use of linear feet "may be more appropriate for determining compensatory mitigation amounts for aquatic resources that are more linear in nature, such as streams." However, it goes on to say that "District engineers retain the discretion to quantify stream impacts and required compensatory mitigation in terms of area or other appropriate units of measure." (73 FR 19633) The district engineer should take into account the information provided below when deciding which type of metric is appropriate for quantifying the credits produced by the removal of an obsolete dam or other structure. The appropriate metric should accurately quantify the amount of credits produced by the mitigation project.

In practice, many stream mitigation credits have been quantified using linear foot metrics such that it has become the general practice. Similarly, using area-based metrics has become the general practice for quantifying wetland mitigation credits. While no crediting metric is perfect, the goal is to attempt to quantify the accrual or attainment of aquatic resource functions produced by the compensatory mitigation project. One helpful resource for District Engineers to refer to is a study published by Doyle et al. (2015)[2] that discusses the use of linear foot and area based metrics to quantify mitigation credits.

The physical, chemical, and biological processes (functions) performed by streams, wetlands, and other ecosystems occur over the water and land area occupied by those ecosystems and those functions vary among the different ecosystem types. The impacts to waters and wetlands authorized by DA permits also occur over a discrete area of those waters or wetlands. Ecological processes performed by streams occur in three dimensions: longitudinally (along the stream channel), laterally (from the stream channel to the adjoining floodplain or riparian area), and vertically (the interaction of the stream channel and riparian area/floodplain with the hyporheic zone). For the removal of obsolete dams and other structures in larger riverine systems, (e.g., 3rd, 4th, and 5th order streams under the Strahler classification system) mitigation credits may be better quantified on an area basis by using acres or square feet of stream ecosystem restored, or an area of stream ecosystem linked to the output of a rapid ecological assessment method. For the removal of obsolete dams and other structures in headwater streams (e.g., 1st and 2nd order streams under the Strahler classification system), mitigation credits can continue to be quantified in linear feet of stream channel restored, if that is appropriate. No matter the units being used, the functions performed should be assessed appropriately for the resource.

Just as restoring larger wetland areas typically produces more wetland credits, restoring larger streams can produce larger numbers of stream credits, thus increasing mitigation credit availability in a watershed. Many obsolete dams are located in larger streams (e.g., 3rd, 4th, and 5th order streams under the Strahler classification system) and removal of those dams has the potential to restore substantial amounts of stream channel. For many years, district engineers have used tools to quantify wetland mitigation credits using acres or square feet; similar tools can be used for quantifying stream mitigation credits using acres or square feet.

D. Losses of Wetlands as a Result of the Removal of Dams or Other Structures

Ecosystem restoration activities are intentional interventions that aim to return impaired ecological processes to their historic continuity or original ecological trajectory. The Corps' regulations at 33 CFR 332.2 define "restoration" as "the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic

[2] Doyle, M.W., J. Singh, R. Lave, and M.M. Robertson. 2015. The morphology of streams restored for market and non-market purposes: Insights from a mixed natural-social science approach. Water Resources Research 51:5603-5622.

functions to a former or degraded aquatic resource." Dams and other obstructions usually degrade or impair streams, and reduce the functions they perform. Removing obsolete dams and other structures is a process-based approach to restoration that returns natural/historic functions, including connectivity, that were performed by the stream before the dam or other obstruction was built. The removal of obsolete dams and other structures can be an ecologically effective and sustainable restoration activity that improves natural physical, chemical, and biological stream processes because it directly addresses a substantial cause of stream degradation.

Wetlands may develop in, or next to, impoundments formed by dams or other structures that alter stream hydrologic processes and impair other physical, chemical, and biological processes. Such wetlands therefore result from man-made impairment of streams. In some circumstances, the wetlands in these impoundments may have poor water quality because of the alteration of stream flow caused by the obsolete dam or other structure. Removal of an obsolete dam or other structure to restore a free-flowing stream may result in the loss of those wetlands as the impoundment is replaced by flowing water. However, after the natural stream flow is restored, higher quality wetlands may become re-established in the riparian area/floodplain after the obsolete dam or other structure is removed and natural stream flows are restored. The quality of the wetlands in an impoundment prior to the removal of an obsolete dam or structure and the quality of any wetlands that establish in the riparian area/floodplain following the restoration of natural stream flows should be taken into account when determining whether there is a net increase in aquatic resource functions as discussed in the paragraph below.

Losses of wetlands that occur as a result of stream restoration through the removal of obsolete dams and other structures should not require compensatory mitigation. The objective of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." (33 U.S.C. 1251(a)) This objective applies to all of the Nation's waters, not just wetlands. Consistent with this objective, the removal of obsolete dams or other structures restores the physical, chemical, and biological integrity of streams. The restoration of streams and other aquatic resources that results from the removal of obsolete dams and other structures should not require compensatory mitigation if those actions result in net increases in aquatic resource functions. When determining whether the action will result in a net increase in aquatic resource functions, the district engineer should consider the aquatic resource functions currently being provided by the stream and any associated riparian areas/floodplains/riverine wetlands under pre-restoration conditions (i.e., immediately prior to removal of the dam or other structure) versus the aquatic resource functions that are expected to be provided by the stream and any associated riparian areas/floodplains/riverine wetlands after the obsolete dam or other structure is removed.

5. <u>Duration</u>

This guidance remains effective unless revised or rescinded.

SCOTT A. SPELLMON
Major General, U.S. Army
Deputy Commanding General for Civil and Emergency Operations