Guidance on Wetland Mitigation in Washington State

Part 1: Laws, Rules, Policies, and Guidance Related to Wetland Mitigation

Washington Department of Ecology
U.S. Army Corps of Engineers, Seattle District
Environmental Protection Agency, Region 10

April 2004
Ecology Publication 04-06-013a
Printed on recycled paper

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Refer to publication #04-06-013A.

For *Part 2 - Guidelines for Developing Wetland Mitigation Proposals and Plans* refer to publication #04-06-013B.

A recommended citation will be provided here in the final document

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PREFACE

Over the past decade numerous studies of wetland mitigation have been conducted. The results of these studies reveal that mitigation continues to have significant shortcomings. Although mitigation may be doing better than it was 10 years ago and better than some previous studies have shown, a recent set of studies (Johnson et. al 2000 and 2002) suggests that the state of Washington is still experiencing a net loss of wetland acreage and functions due to authorized wetland impacts. However, the study also suggested that changes in the use of enhancement as a mitigation tool and increased follow-up on mitigation projects could substantially improve the success of wetland mitigation.

The Washington State Department of Ecology (Ecology), Seattle District of the US Army Corps of Engineers (Corps) and Region 10 of the Environmental Protection Agency (EPA) have jointly developed this updated guidance on wetland mitigation with the goal of improving the success of compensatory mitigation in Washington State overall and in the context of a regional landscape approach. This new guidance is intended to update and replace the previously published 1994 *Guidelines for Developing Freshwater Mitigation Plans and Proposals* (Ecology Publication #94-29).

This updated guidance is also part of a long-term effort by the Corps of Engineers (Corps) to improve compensatory mitigation stemming from the recommendations of a 2001 National Academy of Sciences (NAS) study ("Compensating For Wetland Losses Under the Clean Water Act") and consequential National Wetlands Mitigation Action Plan. The new guidance will incorporate recommendations from the NAS study (see Appendix A, National Research Council's Mitigation Guidelines) along with implementation guidance from the Corps Headquarters.

About this document

This document does not provide new requirements for wetland mitigation but rather attempts to compile all of the existing information, including currently available science, and current agency policies on mitigation. It provides an overview of the role the agencies play in regulating wetlands and some of the factors that go into the agencies' wetland permitting decisions in regards to mitigation. This document also updates and replaces the portions of the 1997 Ecology publication, *How Ecology Regulates Wetlands* (Ecology Publication #97-112), pertaining to wetland mitigation.

What are the goals and objectives of this document?

The agencies developed this guidance document, Parts 1 and 2, in order to:

- Improve the quality and effectiveness of compensatory mitigation.
- Streamline the permit process and provide more predictability by providing clear and useful guidance on state and federal requirements for compensatory mitigation.
- Establish guidance on compensatory mitigation that is consistent among the federal and state wetland regulatory agencies in Washington (Corps, EPA, and Ecology).
- Provide guidance on compensatory mitigation that is based on "Best Available Science" (BAS).
- Establish guidance that should be consistent with local government mitigation requirements as they update their wetland regulations to include BAS.
- Provide guidance in a format that is user-friendly, easy to update, and web-accessible.

This guidance should assist in the development of proposals for compensatory mitigation for impacts to wetlands (primarily for single projects) authorized under Section 404 of the Clean Water Act (33 USC § 1344) and/or the State of Washington's Water Pollution Control Act (Chapter 90.48 RCW). The contents of this document range from basic principles for wetland mitigation for the general public to more detailed information and guidance for wetland professionals. The document also contains many references to additional sources of information pertinent to wetland mitigation.

What is different about this guidance compared to the previous published guidance documents?

- The 1994 *Guidelines for Freshwater Mitigation Plans and Proposals* has been expanded to provide more details on environmental considerations during the planning process. Previously it only had an annotated outline of what needed to be in a mitigation plan. Part 2 of this document has an updated version of the annotated outline.
- There has been a shift from always requiring "on-site and in-kind" mitigation and having that preference drive site design to landscape-driven site selection and design.
- The agencies encourage applicants to shift their emphasis from excessive engineering and climax communities to compensatory mitigation that makes ecological sense and is sustainable. This includes assuring there is an ample and

stable supply of water for the wetlands that invasive species are minimized, and the mitigation is appropriate for its landscape location.

- The recommended approach to compensation is doing what makes the most ecological sense and has the greatest potential to replace or improve on what is being lost in a landscape context (if a watershed plan already exists in the area of project development, considering that plan in site selection should be a priority)
- Complex planting schemes are discouraged. Instead, plantings should be kept simple with attention paid to the basic principles of plant succession.

How is this publication organized?

This publication is divided into two parts.

Part 1 describes the laws, rules, policies, and guidance pertinent to wetland mitigation and is intended to provide an overview of wetland regulatory programs in Washington, describe the basic elements of the mitigation process, particularly compensatory mitigation, and provide detailed guidance on agency mitigation policies.

Part 2 provides technical information and guidance on developing proposals for wetland mitigation and preparing project as-built plans and monitoring reports.

Both parts of this guidance, while focusing on freshwater wetlands, are relevant to mitigation involving estuarine and tidal wetlands as well as other aquatic resources, such as streams and upland buffers associated with these resources.

The guidelines are relatively general to allow for site-specific flexibility. Furthermore, due to the dynamic nature of wetland science and regulatory frameworks, the guidelines are subject to revision. Make sure you have the most recent version of this document as well as any addendums.

If viewing this document on your computer, there are numerous links to referenced sections within the document. If you are also connected to the internet there are hyperlinks to referenced documents. Just click the CTRL key and the link you wish to go to.

If you have a hard copy version of this document please see the Web Addresses for Hyperlinks, Other On-line Resources and References sections at the end of the document for a complete list of internet addresses and references for hyperlinked documents.

Words found in the **Glossary** are bold and underlined.

ACKNOWLEDGEMENTS

We'd like to thank all of those who assisted in the development of this document, including the members of the project Steering Committee. Other individuals, including wetland consultants and local government staff also provided much needed input. Thanks to their help, we expect that this document will prove valuable to both wetland professionals and those simply seeking a basic understanding of wetland mitigation.

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FUNDING

Funding for the development of this document was provided from the EPA Region 10 and EPA Headquarters (Grant #'s CD 97025101-2 and CD 97058501-0) with matching funds from the Washington State Department of Ecology.

Note: If you are reading a paper copy of this document after January 1, 2005 please check the guidance website at http://www.ecy.wa.gov/programs/sea/wet-updatedocs.htm to make sure you have the most recent version.

Part 1

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April 2004
Publication # 04-06-013A

Printed on recycled paper

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INTRODUCTION

Welcome to Part 1 of the two-part Washington State guidance for wetland mitigation. This guidance resulted from a collaborative effort between the Washington State Department of Ecology (Ecology), the Seattle District of the United States Army Corps of Engineers (Corps) and Region 10 of the United States Environmental Protection Agency (EPA). The three agencies are providing this guidance document to assist the regulated community in complying with environmental laws and regulations affecting wetlands and providing more successful and sustainable replacement wetlands.

In the following sections you will find information on:

- The general permit process including mitigation sequencing
- The laws, rules and policies that apply to projects where wetlands are involved
- Agency policies, requirements, and recommendations for compensatory mitigation.

More technical information on the preparation of proposals and plans for compensatory mitigation can be found in Part 2 of this guidance.

Legal requirements change over time. Please contact the appropriate agencies and check the Department of Ecology website (Wetlands Home Page) for the most up to date guidance.

PERMIT PROCESSES

Many federal, state and local laws require a permit or authorization for any type of construction or other activity in wetlands. Thus, it's a good idea to identify any environmental permits or licenses that may be required by the federal, state, and local government. In general, the state Office of Regulatory Assistance will help applicants to develop a plan for meeting environmental and land-use requirements. However, if the proposed work will take place in or near wetlands or other waters, applicants should contact the Corps, the appropriate Ecology regional wetland specialist, and the local government (see Appendix B, Agency Contacts). Pre-application meetings or conversations with the appropriate wetland regulatory staff may save time and money in the long run.

Not sure if your project site contains wetlands?
Hire a wetland consultant to delineate any wetland areas on the property. See "Hiring a Qualified Wetlands Specialist" in Appendix C.

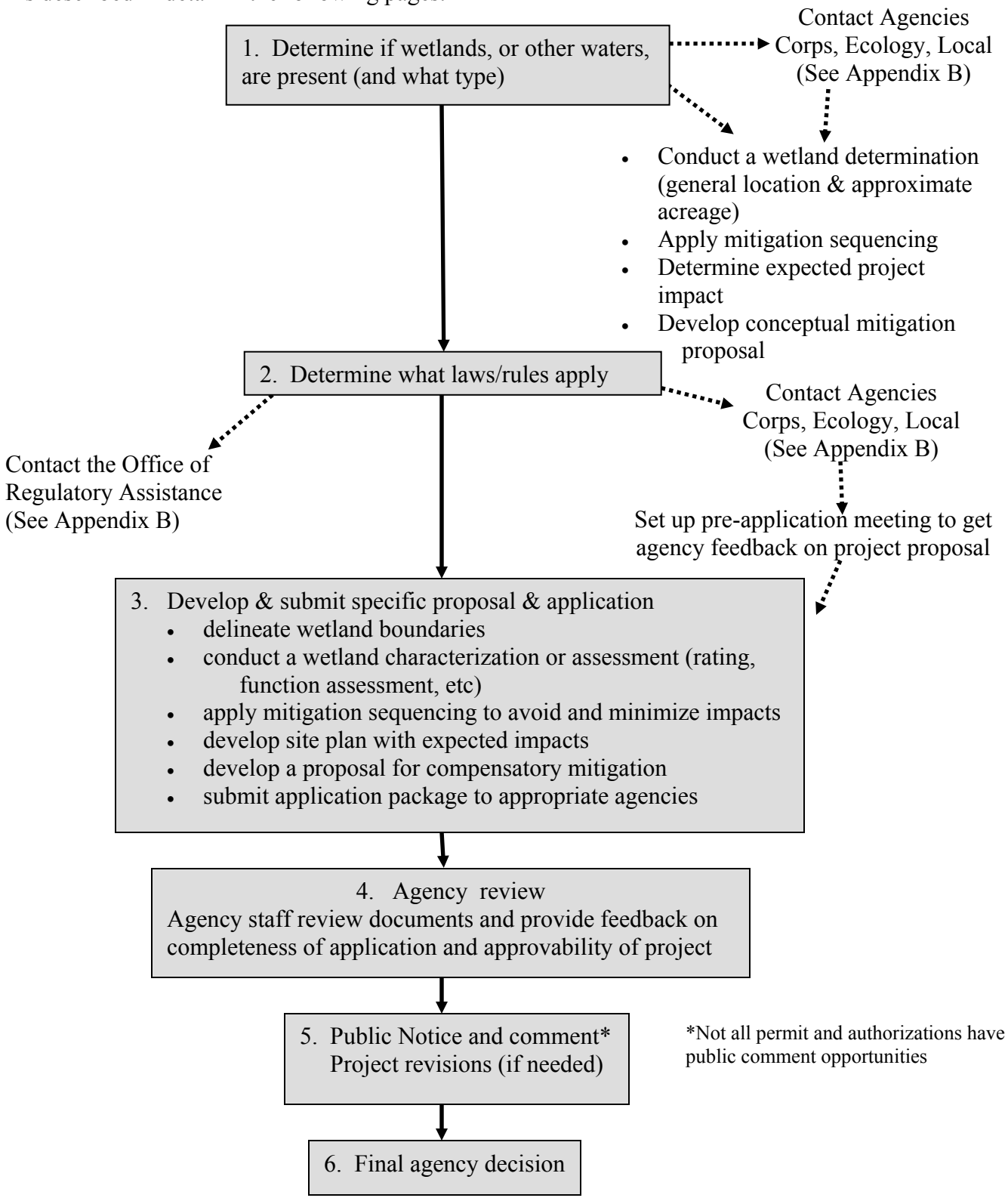
The laws, rules and policies related to wetland protection and mitigation are described in following sections (See p. 9, What Laws and Rules Apply to Wetlands?)

The determination of whether a wetland is regulated by the Corps, the state, or a local government must be made by the appropriate agency(ies). In other words, each agency is responsible for determining its own jurisdiction. Therefore, we suggest that you contact each agency separately since one agency cannot speak for any other agency.

Contact the Office of Regulatory Assistance (360-407-7037 or 800-917-0043 or email: ecypac@ecy.wa.gov) for help in determining which permits and authorizations you may need and help in navigating the regulatory processes.

What are the Basic Steps in the Permit Process?

If you wish to determine whether laws and rules apply in your particular situation, you can follow the process illustrated below in the generalized flowchart. Each of these steps is described in detail in the following pages.



Do you have a wetland present?

To determine if any wetland laws or rules apply to your particular situation, the first thing you need to know is whether you have a wetland on site that is within the jurisdiction of any wetland laws and rules. You must determine if there is a "wetland" as defined by the respective laws and rules. Additionally, you may also need to know how big it is, what type of wetland you have, and where it is relative to other water bodies because some laws and rules apply only to wetlands of a particular size, some only apply to certain types of wetlands based on their location, classification, or rating, and others only apply to wetlands that are adjacent to or associated with other water bodies. Also, based on the size and type of wetland, most regulations require that any impacts be mitigated (See p. 37, What is Mitigation Sequencing? and p. 39 What Types of Impacts Require Compensation?)

The first step is to determine if there is a "wetland" as defined by the respective laws and rules. Many people are confused about the difference between wetland definition and wetland delineation. The terms are often used interchangeably, thus contributing to the confusion. Simply put, a wetland *definition* tells what a wetland is, and a *delineation method* is used to identify the boundaries of a wetland on the ground.

Most **wetland definitions** include some reference to having water present long enough to form distinct soils and specialized vegetation. A **wetland delineation method** is used to determine the boundaries of wetlands using technical criteria. While a delineation manual is generally used to determine jurisdiction for regulatory purposes, there are cases where an area may meet the required technical wetland criteria in the manual yet is not regulated. Therefore, in understanding wetland regulation it is important to distinguish between the following wetland definitions: "biological" and "jurisdictional". Additionally, you will need to know if your activity is exempt on certain rules.

What is a Biological Wetland?

A biological wetland is one that is determined to have the physical, biological and chemical characteristics to be called a wetland. Essentially, the site needs to have the right *soils*, the right amount of *water* at the right time of the year and *plants* which prefer to live in saturated soils. Several definitions were developed over the years attempting to describe a biological wetland. The most recent one, called *a reference definition* by the National Academy of Sciences, states: "A wetland is an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical and biological features reflective of recurrent, sustained inundation or saturation. Common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These features will be present except where specific physiochemical, biotic, or anthropogenic factors have removed them or prevented their development."

Not all biological wetlands are regulated. Some wetland areas are specifically exempted under certain laws. For instance, ponds that were created from non wetland areas for livestock watering are not regulated under several laws. You will need to determine whether your wetland is subject to any laws (is a "jurisdictional wetland".) See the following section for information on jurisdictional and regulated wetlands.

What is a Jurisdictional Wetland?

A jurisdictional wetland is one is that regulated by the provisions of a particular law. It may be the same as a biological wetland or it may represent a subset of biological wetlands. For example, the Shoreline Management Act (SMA) has defined wetlands under its jurisdiction as being all wetlands associated with tidal waters and certain lakes and rivers. Most freshwater wetlands in the state are not within shoreline jurisdiction. The SMA definition further restricts jurisdictional wetlands by specifically excluding artificial wetlands intentionally created from non-wetland sites such as canals, farm ponds and landscape amenities. Thus, even though some of these areas may meet the above biological definition, the SMA would not regulate them.

Additionally, different laws may regulate wetlands differently and a wetland may be a jurisdictional wetland under one law but not under another. For instance, isolated wetlands and prior converted croplands (see next page) are not jurisdictional under Section 404 of the federal Clean Water Act[1], while under the state water pollution control act and local critical area regulations they are jurisdictional wetlands. Conversely, wetlands under a certain size (e.g. 2500 ft^2) may be exempt (non jurisdictional) under local regulations but they are still jurisdictional under state and federal laws and regulated by the Corps and Ecology. It is best to contact the appropriate agencies to determine whether your wetland site is jurisdictional.

What do you mean by an Exempt Activity?

While most jurisdictional wetlands are going to be protected under law to some extent, there are often certain activities that are exempt from a given law. This results in some jurisdictional wetlands not being regulated when the impacts are occurring because of an exempt activity. For example, a wetland may fall under SMA jurisdiction because it meets the specific criteria contained in the SMA wetland definition. However, if the wetland occurs in an area that is currently in agricultural production, a landowner could plow the wetland to plant a crop without having to get a shoreline permit because this activity (on-going agriculture) is generally exempt from regulation. (*Please note that the local government may still need to review the project to determine that exempt status applies. Also, please be aware that the agencies[2] do regulate the conversion of wetlands*

[1] See box on page 8, the Corps is responsible for determining whether or not a wetland is jurisdictional under Section 404 of the Clean Water Act, not the project applicant or other agency.

[2] Throughout this document, when the term "agencies" is used, it refers to the Corps, Ecology and EPA.

to cropland if those wetlands are not currently in agricultural production). Activities that are exempt under one law may not be exempt under other laws and rules. Please check with the appropriate agencies to determine whether your proposal is exempt.

What are Prior Converted Croplands?

Prior Converted Croplands (PCC) are former or existing wetlands that do not pond or flood for more than 15 consecutive days during the growing season and have a cropping and plowing history before 1985. In 1990[3], the Corps of Engineers determined that PCC are not regulated under the Section 404 program. However, PCC wetlands which meet the state's delineation criteria[4] are still regulated under the State's Water Pollution Control Act (Chapter 90.48 RCW). For agricultural lands continuing in agricultural use, the Natural Resources Conservation Service (NRCS) has the lead for verifying and/or conducting wetland delineations and PCC determinations. For agricultural lands being converted for other uses, the Seattle District has the lead for verifying and/or conducting wetland delineations and PCC determinations (Special Public Notice – July 23, 2002). For PCC determinations, proof that the subject land has been in commodity crop production a minimum of once every five years since 1985 must be submitted.

Are Isolated Wetlands Regulated any more?

Under the Clean Water Act (CWA), federal protection of wetlands is extended to those wetlands located on or adjacent to **navigable waters** of the United States or their tributary systems. Wetlands that do not meet this requirement, such as isolated wetlands with no link to interstate commerce, are not "**waters of the United States**" and are therefore not protected under the CWA. Prior to 2001, the presence of migratory birds was considered sufficient to establish an interstate commerce nexus and CWA protection for isolated wetlands. However, in 2001, the U.S. Supreme Court ruled in SWANCC *v.* USCOE[5] that the presence of migratory birds is by itself not a sufficient basis for asserting CWA jurisdiction over isolated, intrastate, non-navigable water bodies. As a result of this ruling, many isolated wetlands in Washington are no longer protected by federal law.

Though not always protected under federal law isolated wetlands perform the same important environmental functions as other wetlands, including recharging streams and aquifers, storing flood waters, filtering pollutants from water, and providing habitat for a host of plants and animals. These wetlands continue to be protected under state and local laws and rules.

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[3] Regulatory Guidance Letter 90-07

[4] Washington State Wetland Identification and Delineation Manual (WAC 173-22-080)

[5] Solid Waste Authority for North Cook County v. US Army Corps of Engineers

The Supreme Court ruling regarding the regulation of isolated wetlands under the federal Clean Water Act did not change Washington state laws governing wetlands. The state Water Pollution Control Act (90.48 RCW) and associated regulations (WAC 173-201A) makes no distinction between isolated or non-isolated wetlands. All "**waters of the state**" are covered by state law, and that includes isolated wetlands. Likewise, the Shoreline Management Act (SMA) and the Growth Management Act (GMA) also regulate isolated wetlands.

Ecology continues to regulate isolated wetlands and apply the water quality standards prescribed by state law. However, Ecology's process for regulating projects involving isolated wetlands is now different from the process for other types of wetlands. Instead of using the 401 Certification process, Ecology uses administrative orders issued under its authority under Chapter 90.48 RCW to regulate projects involving isolated wetlands. The standards of review however, remain the same. For more information see Appendix D, Isolated Wetlands Focus Sheet.

Important Note: The Corps of Engineers, not applicants or their consultants, has authority to determine whether or not a wetland is a water of the U.S. and thus regulated under the federal Clean Water Act (CWA). If the Corps determines that a wetland is not subject to regulation under the CWA, applicants should be aware that these wetlands are still regulated by Ecology under the State's Water Pollution Control Act as well as by local jurisdictions.

WHAT LAWS AND RULES APPLY TO WETLANDS?

In the state of Washington, protection of wetlands occurs at the three levels of government: federal, state, and local. The various government agencies involved in protecting wetlands each carry out their responsibilities in different ways, reflecting the different laws, regulations (rules), and policies that govern each agency's program. Tribes also play an important role in wetland regulation.

Various federal, state, and local laws and rules apply to construction and other activities in wetlands and adjacent areas. Some of them, however, only apply to certain wetlands or certain activities in wetlands, and the provisions of these laws and rules are varied. As a result, case-by-case review is needed, and applicants are advised to contact the appropriate agency(ies) prior to developing their project. Contacting the U.S. Army Corps of Engineers (Corps), Washington State Department of Ecology (Ecology), or your local planning department will provide the best start. The following section describes each of the laws, rules, policy, and guidance that may apply to any proposed activities in wetlands. At the end, a table summarizes the most pertinent laws and rules. For more information on each law contact the responsible agency. Addresses and phone numbers for federal and state agencies are provided in Appendix B.

Federal Laws and Rules

Clean Water Act (33 USC § 1251 et seq.) (also known as the Federal Water Pollution Control Act)

Under Section (§) 404 of the Clean Water Act (CWA), the Secretary of the Army, acting through the U.S. Army Corps of Engineers (Corps), regulates the discharge of **dredged** or fill material into **waters of the United States**, including **wetlands**. The Corps' Regulatory Program is the primary federal tool for protecting wetlands and other aquatic resources of the United States. Anyone proposing to discharge dredged or fill material into waters of the United States must first obtain authorization from the Corps.

The Corps has the responsibility and authority (33 CFR 320-330) to require permit applicants to implement all appropriate and practicable measures to minimize the adverse impacts of their activities on wetlands, ensure that those activities are not contrary to the public interest, and satisfy legal requirements such as the §404(b)(1) guidelines (see p. 19, Federal Policies and Guidance).

It should be noted, that ***not all wetlands are regulated under the CWA***. For instance, certain types of agricultural wetlands and some intrastate, isolated wetlands are not considered to be waters of the U.S. (see p. 5, Do you have a wetland present?).

Under §401 of the CWA, activities involving a discharge of pollutants (such as dredged or fill material) authorized by a federal permit or license, such as a §404 permit, must receive certification from the state that the activity complies with the water quality standards of that state and any established effluent limitations (such as those under a water clean up plan[6]). The §401 certification signifies that the state has reasonable assurance that the project as proposed and conditioned will comply with water quality standards and other applicable requirements of state law. The Washington State Department of Ecology (Ecology) is the state agency responsible for §401 water quality certifications in Washington (see p. 13, State Laws and Rules). A §401 water quality certification must be obtained from Ecology before the federal permit can be issued.

In other words, projects in the state of Washington requiring a §404 permit from the Corps for discharge of pollutants (such as dredged or fill material) in wetlands, must also receive a §401 certification from Ecology. This certification verifies that the discharge (e.g., fill material) proposed for the project will not compromise or exceed state water quality standards. Essentially, it gives a state the ability to determine whether the proposed discharge meets state water quality standards and to impose appropriate conditions on the project to protect water quality.

The Environmental Protection Agency (EPA) is also responsible for implementing and enforcing §404 (40 CFR Part 230). The EPA oversees the Corps Regulatory Program and is responsible for application of the 404(b)(1) guidelines for CWA permits. On some[7] **Tribal lands** and within all national parks where the State has not been given jurisdiction for water quality certification, the EPA is responsible for issuing water quality certifications (401 certifications.) In Washington, national parks where the state does not have 401 jurisdiction include Olympic, Mount Rainier and North Cascades National Parks.

National Environmental Policy Act of 1969 (42 USC § 4321 et seq.)

The National Environmental Policy Act (NEPA) is the national charter for protecting and enhancing the quality of the nation's environment. NEPA directs the federal government to assess the likely impact of its proposed actions on the environment. For individual permits under the Corps' §404 program, applicants for a federal §404 permit are required to complete an alternative analysis which documents that no reasonable alternative to the

[6] Water clean up plans or TMDLs (Total Maximum Daily Load plans) are developed for waters which are impaired (i.e. not meeting water quality standards) due to various pollutants. These water clean up plans may set limits on the amount of specific pollutants that can be discharged into a water body. The limits are referred to as "effluent limitations".

[7] Some tribes have been given exclusive jurisdiction for activities occurring on their lands. Check with the EPA for a current list of approved tribes.

proposed action exists and that every effort had been made to minimize damage to wetlands and aquatic resources[8].

Note: Compliance with the following laws is the responsibility of the lead federal agency. Federal agencies will coordinate with applicants to ensure that compliance occurs.

Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 USC § 661 et seq.)

The Fish and Wildlife Coordination Act, authorizes the Secretary of the Interior, through the U.S. Fish and Wildlife Service (USFWS), to assist and cooperate with federal, state, and public or private agencies and organizations in the conservation and rehabilitation of wildlife whenever the waters of a stream or other waterbody would be impounded, diverted, deepened, or otherwise controlled or modified. The act requires proponents to also consult with the state wildlife resources agency and, when appropriate, the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries). This coordination helps to conserve our wildlife resources by preventing or reducing the loss of those resources and, whenever possible, improving those resources.

Coastal Zone Management Act (16 USC §1451 et seq.)

The Coastal Zone Management Act (CZMA) requires states to review all federal permits and licenses for consistency with the state's coastal management program. In Washington State, Ecology is the state agency responsible for this review. CZM review applies only to Washington's 15 coastal counties. For projects located within Shoreline Management Act (SMA, see p. 13, State Laws and Rules) jurisdiction, compliance with SMA requirements is sufficient to meet CZM provisions. Ecology must issue a separate notice of CZM consistency for projects located outside of shoreline jurisdiction.

Endangered Species Act (16 USC 1531 et seq.)

The Endangered Species Act (ESA) establishes a federal program to conserve the ecosystems upon which endangered and threatened species depend. It also establishes a policy that federal agencies and departments seek to conserve endangered and threatened species. Section 7 of the ESA requires federal departments and agencies to consult with the NOAA Fisheries and/or the USFWS to ensure that the actions they authorize, fund, or carry out do not jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of designated critical habitat

[8] Under the Corps' §404 Nationwide Permit Program, this alternatives analysis has already been completed so applicants are not required to conduct an alternatives analysis for a Nationwide Permit. They are, however, required to show that impacts have been avoided and minimized to the greatest extent possible.

for those species. The lead federal agency for a project is responsible for ensuring compliance with the requirements of Section 7 of the ESA. Section 9 of the ESA, prohibits all individuals, governments, and other entities from "taking" listed species of fish and wildlife except as exempted under Section 10 of the ESA (see p. 33, How does Wetland Mitigation Integrate with the ESA?).

Magnuson-Stevens Act (16 USC § 1801 et seq.)

The Magnuson-Stevens Act (MSA) is the federal law that governs marine fisheries management in the United States. Among its provisions, the MSA mandates the identification of essential fish habitat (EFH) for federally managed species as well as the development of measures to conserve and enhance the habitat necessary for fish to carry out their life cycles. The MSA requires federal agencies to consult with the NOAA Fisheries before they authorize, fund or conduct an activity that may adversely affect EFH. When consulted, NOAA Fisheries provides guidance, in the form of conservation recommendations, to help federal agencies minimize the impact of their actions on EFH. As with the Endangered Species Act, the lead federal agency is responsible for ensuring compliance with this act.

National Historic Preservation Act of 1966 (16 USC 470 et seq.)

Section 106 (16 USC § 470f) of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies, including the Corps to make a determination on how a project may affect recorded or undiscovered **cultural resources** and/or **historic properties** within the permit area. Section 106 of the NHPA states, in part, a Federal agency "having direct or indirect jurisdiction" over a proposed **federal undertaking** shall, prior to approval of the undertaking, take into account the effect of the undertaking on any historic property "in or eligible for inclusion in the National Register of Historic Places." A cultural resource/historic property survey, conducted by a professional archaeologist, may be required for the specific project impact area and compensation areas. Based on the results of the survey, the Corps will take the lead on conducting the appropriate Section 106 consultation with the **State Historic Preservation Office** or **Tribal Historic Preservation Office**. Applicants should be aware that Section 106 coordination and/or consultation may add substantial time to the application and mitigation review.

State Laws and Rules

State Water Pollution Control Act (Chapter 90.48 RCW)

The State Water Pollution Control Act directs Ecology to protect state water quality by controlling and preventing the pollution of streams, lakes, rivers, ponds, inland waters, salt waters, water courses, and other surface and underground **waters of the state** of Washington. The law directs Ecology to establish water quality standards that will uphold the state's water quality. A certification issued under § 401 of the Clean Water Act reflects the state's determination that a project approved by the Corps complies with state water quality standards and other applicable requirements of state law (see p. 9, Federal Laws and Rules).

Currently, the state is using its authority under the Water Pollution Control Act to review and authorize projects that will result in the alteration or loss of isolated wetlands and prior converted croplands (PCC) that are not within Corps jurisdiction (see p. 5, Do you have a wetland present?) Also, refer to Ecology's focus sheets on Isolated wetlands and PCC found in Appendix D.

Shoreline Management Act (Chapter 90.58 RCW)

The Shoreline Management Act (SMA) of 1971 was enacted to protect the State's shorelines and the reasonable uses of those shorelines. The Shoreline Management Act states that the intent of the act is to "provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses" of those shorelines (Chapter 90.58.020 RCW). Uses identified in the SMA include state interests, preserving the natural character of the shoreline, protecting the resources and ecology of the shoreline and public access. State shorelines include shorelines of lakes over 20 acres in size and rivers and streams with flows greater than 20.0 cubic feet per second (cfs). State wetland jurisdiction under the SMA is limited to uplands and wetlands within 200 feet of the shoreline and wetlands that are associated with regulated water bodies. Associated wetlands can be located beyond the 200-foot zone if they influence or are influenced by the SMA-regulated water body. The SMA also requires local jurisdictions to adopt shoreline master programs to protect the state's shorelines (See p. 17, Shoreline Master Program).

Growth Management Act (Chapter 36.70A RCW).

The Growth Management Act (GMA) requires local governments to designate and protect **critical areas**, which include wetlands. Local jurisdictions must use best available science (BAS) when reviewing and revising policies and regulations for critical areas (Chapter 36.70A.172 RCW). Requirements for wetland protection standards, buffers, and wetland mitigation vary from jurisdiction to jurisdiction, so contact your

local planning and development services department to get information on local requirements for projects involving wetlands. The Department of Community, Trade and Economic Development, a state agency, is another resource for information on local rules affecting wetlands. Ecology provides technical assistance to local governments under GMA.

Wetland Delineation Manual [9] (Chapter 36.70A.175 RCW, Chapter 90.58.380 RCW, Chapter 173.22.080 WAC).

The state legislature passed a law in 1995 directing Ecology to "adopt a manual for the delineation of wetlands under this chapter that implements and is consistent with the 1987 manual in use on January 1, 1995, by the Corps of Engineers and the Environmental Protection Agency" (RCW 90.58.380). Ecology has adopted a Washington State Wetland Identification and Delineation Manual (Chapter 173.22.080 WAC), which includes clarification guidance on the 1987 manual published by the Corps as well as regional guidance issued by the Seattle Corps and Region 10 office of the EPA. This state manual is required to be used by all state agencies in the application of any state laws and regulations. Cities and counties must also use the state manual in the implementation of any regulations under the Growth Management Act (RCW 36.70A.175). Refer to page 17, Local Laws and Rules.

State Environmental Policy Act (Chapter 43.21C RCW).

The Washington State Environmental Policy Act (SEPA) provides a way to identify possible environmental impacts that may result from state and local government decisions, such as issuing permits for private projects, constructing public facilities, or adopting regulations, policies, or plans. Information provided for the SEPA review process helps state and local government decision-makers, applicants, and the public understand how a proposal would affect the environment. This information can be used to revise a proposal to reduce likely environmental impacts, to condition the proposal so that impacts are mitigated, or to deny a proposal when adverse environmental impacts cannot be mitigated.

Aquatic Resources Mitigation Act (Chapter 90.74 RCW)

The Aquatic Resources Mitigation Act articulates the state's policy to encourage innovative mitigation measures for infrastructure projects. Innovative mitigation measures address compensatory mitigation alternatives that are not in-kind and on-site. The law directs Ecology and the Washington Department of Fish and Wildlife to consider a watershed-based mitigation proposal that provides equal or better biological functions and values than on-site options when they are reviewing an infrastructure project. The

[9] Washington State Department of Ecology. 1997. Wetlands Identification and Delineation Manual. Publication #96-94. Olympia, WA.

state's Alternative Mitigation Policy (see p. 25, State Policies and Guidance) is consistent with the above mentioned directives of this law.

Wetlands Mitigation Banking Act (Chapter 90.84 RCW)

This law articulates the state's policy to support wetland mitigation banks as an important tool for compensating for wetland losses. The law directs Ecology to develop rules for a statewide certification process to ensure that approved wetland banks are environmentally sound and the process is predictable for applicants. Ecology has completed a draft bank certification rule, which currently provides guidance on developing wetland banks in Washington.

Hydraulic Code (Chapter 77.55.100 RCW)

This law, passed in 1949, is intended to protect fish from harm in all marine and fresh waters of the state. This law is implemented through a permit called the Hydraulic Project Approval (HPA) and administered by the Washington Department of Fish and Wildlife. The permit is required for any project that will "use, divert, obstruct or change the natural flow or bed of any of the salt or fresh waters of the state." While not directly intended to protect wetlands, the HPA is required for any work that affects the bed or flow of state waters including all work within the mean higher high water line in salt water or within the ordinary high water line in fresh water, which often includes wetlands.

Forest Practices Act (Chapter 76.09 RCW)

This law and its implementing regulations (Chapter 222 WAC) apply the wetland provisions of the federal Clean Water Act and Washington State Water Pollution Control Act (Chapter 90.48.425 RCW) on state and private forest lands. Section eight of the Forest Practices Manual (Chapter 222 WAC) contains an abbreviated wetland delineation manual. Prohibitions or restrictions for timber harvest along streams and within wetlands and their buffers are detailed in the Forest Practices Manual.

Antidegradation Policy (WAC 173.201A.300)

The implementing rules for the state Water Pollution Control Act (Chapter 90.48 RCW) contain an antidegradation policy (WAC 173-201A.300) that applies to human activities which may impact state water quality. The purpose of the antidegradation policy is to restore and maintain the quality of the surface waters of Washington and ensure that all human activities which may degrade the water quality "at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment." The policy calls for three levels of protection for surface waters:

- Tier I is used to ensure existing and designated uses are maintained and protected and applies to all waters and all sources of pollution. "No degradation may be

allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in this chapter" (WAC 173.201A.310).

- Tier II is used to ensure that waters of a higher quality than the criteria assigned in this chapter are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities.
- Tier III is used to prevent the degradation of waters formally listed in this chapter as "outstanding resource waters," and applies to all sources of pollution.

Using the Surface Water Quality Standards for Activities Affecting Wetlands

Ecology's regulation of wetlands, including isolated and prior converted croplands (PCC), ensures that projects are in compliance with the State Water Quality Standards (Chapter 173.201A WAC). The State Water Quality Standards consist of three main elements:

1. Characteristic uses of surface waters;
2. Numerical criteria for conventional water quality parameters that are not to be exceeded (WAC 173-201A-130); and
3. An antidegradation policy (WAC 173.201A.260(3)h).

As discussed in the Ecology publication, *Water Quality Guidelines for Wetlands: Using the Surface Water Quality Standards for Activities Involving Wetlands* (Ecology publication # 96-06), the antidegradation section of the water quality standards is the primary means used to protect water quality in wetlands. Specific numeric criteria for wetland water quality are difficult to establish, hence they are not generally used.

The antidegradation policy establishes the bottom line for water quality protection in the state: "Existing **beneficial uses** shall be maintained and protected and no further degradation which would interfere with or become injurious to existing beneficial uses shall be allowed." Beneficial uses are more or less equivalent to wetland "functions and values" and therefore include: water supply, surface and groundwater treatment, stormwater attenuation, fish and shellfish migration, rearing, spawning, and harvesting, wildlife habitat, recreation, support of biotic diversity, and aesthetics.

Applying the water quality standards to wetlands means that all existing beneficial uses (or functions and values) of wetlands cannot be lost, and if wetland impacts are unavoidable, the loss of beneficial uses must be adequately replaced (compensated).

Local Laws and Rules

Local jurisdictions also play an important role in protecting and managing wetlands. They are responsible for administering state laws as well as their own wetland protection programs and requirements. As always contact your local government for specific information on local requirements and standards prior to conducting any work in wetlands, streams, or other water bodies.

Critical Area Ordinances

Under the Growth Management Act, local jurisdictions (cities, towns, and counties) are required to identify **critical areas**, including wetlands and adopt ordinances protecting those areas. A Critical Area Ordinance (CAO), which is adopted by a local jurisdiction, specifies the permit requirements and standards for wetland protection that will be employed in that particular jurisdiction.

Shoreline Master Program

The Shoreline Management Act (SMA, Chapter 90.58 RCW) directs local jurisdictions to develop shoreline master programs in order to protect the state's shorelines. Shoreline jurisdiction extends a minimum of 200 feet from the ordinary high water mark (OHWM) of a state shoreline. Under the SMA, wetlands that are associated with a shoreline area are regulated, even when they extend beyond 200 feet from the OHWM. Most shoreline master programs require the protection of a buffer in addition to protecting the wetland itself. Projects proposed in the shoreline zone must be consistent with the approved master plan or the applicant must apply for a variance. Consult with the local shoreline administrator for specific situations.

Important Note: Requirements change! Contact the appropriate agencies for the most current information.

WHAT POLICIES AND GUIDANCE APPLY TO WETLAND MITIGATION?

The Corps, EPA and Ecology have each developed policies and guidance for implementing the laws and rules affecting wetlands. The following section highlights the key policies and guidance documents used by the agencies.

Federal Policies and Guidance

Guidelines for Specification of Disposal Sites for Dredged or Fill Material (also known as the 404 (b)(1) Guidelines). (45 FR 85336-85357). December 24, 1980.

Prior to issuing a permit under §404 of the CWA, the Corps must determine that the proposed discharge of dredged or fill material into **waters of the United States** would not be contrary to the public interest and would comply with the "Guidelines for Specification of Disposal Sites for Dredged or Fill Material" (40 CFR Part 230), more popularly known as the 404(b)(1) guidelines. Mitigation sequencing (see p. 37) is an important consideration in both the 404(b)(1) guidelines and the public interest review process.

The 404(b)(1) guidelines, which provide criteria to be used by the Corps to evaluate a proposed discharge, generally prohibit the Corps from authorizing a discharge of dredged or fill material into waters of the United States if: (1) there is a practicable alternative to the proposed discharge that would have less environmental impact, (2) the discharge would violate any applicable state water quality standard or CWA toxic effluent standard or would jeopardize the continued existence of species listed as threatened or endangered under the ESA, (3) the discharge would cause or contribute to significant degradation of the waters of the United States, or (4) appropriate and practicable steps have not been taken to minimize adverse impacts of the discharge on the aquatic ecosystem.

Memorandum of Agreement Between the Environmental Protection Agency and Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (February 6th, 1990)

The Department of the Army and the EPA signed a memorandum of agreement (MOA) that provides guidance for determining the type and level of mitigation necessary to comply with the 404(b)(1) guidelines in the case of standard individual permit

applications. The MOA describes mitigation as a sequential process of avoiding adverse impacts, taking appropriate and practicable steps to minimize adverse impacts, and providing appropriate and practicable compensation for adverse impacts that remain after all appropriate and practicable minimization has been required. The MOA also instituted a preference for on-site, in-kind mitigation and recognized that "no net loss" of wetland functions and values may not be achieved with every permit action. The MOA noted, without providing further guidance, that mitigation banking may be an acceptable form of compensatory mitigation under certain conditions.

US Army Corps of Engineers/EPA Memorandum to the Field: Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 (Regulatory Guidance Letter 02-02), December 24th, 2002.

Regulatory Guidance Letter (RGL) 02-02 was developed to improve the success of compensatory mitigation and help meet the national goal of "no net loss" of wetlands. The RGL also responded to the National Research Council/National Academy of Sciences report on mitigation in the Corps Regulatory Program (NRC 2001). RGL 02-02 provides guidance intended to improve the planning, construction, monitoring, and enforcement of mitigation projects. The RGL will help the Corps' meet its goal of no overall net loss of wetlands by improving the quality of wetland mitigation required as conditions of Corps permits. The RGL focuses on using a landscape-scale approach, requiring wetland mitigation that addresses the ecological needs of watersheds, and ensuring the protection of wetlands and other aquatic areas established as compensatory mitigation.

Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 FR 58605-58614), November 28, 1995.

This multi-agency guidance establishes federal policy on establishing, using, and operating mitigation banks to provide compensatory mitigation for adverse impacts to wetlands and other aquatic resources. This guidance is intended to assist federal agencies, bank sponsors, and others in meeting the requirements of Section 404 of the CWA and other federal statutes and regulations. The banking guidance establishes a process to evaluate mitigation bank proposals, criteria for using a mitigation bank, and requirements for long-term management, monitoring, and remediation of mitigation banks. In addition, this guidance discusses a number of important planning and policy issues, such as the role of preservation, the relationship between mitigation banks and in-lieu fee mitigation arrangements, the approval process, and considerations for bank site development and operation.

Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation Under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 (65 FR 66914-66917, November 7, 2000)

This multi-agency (Corps, EPA, USFWS, and NOAA Fisheries) guidance establishes federal policy on the use of in-lieu fee (ILF) arrangements for compensatory mitigation for adverse impacts to wetlands and other aquatic resources. The goal of the guidance is to clarify the manner in which in-lieu fee mitigation may be used to serve as an effective and useful approach for satisfying compensatory mitigation requirements and in helping to meet federal government's goal of no overall net loss of wetlands. This guidance continues a discussion started in the 1995 federal mitigation banking guidance (see above) by outlining the circumstances under which ILF mitigation can be used and remain consistent with existing federal regulations and policy. This guidance also establishes federal policy on planning, establishing, and using ILF arrangements. This policy is very similar to that applied to mitigation banking.

Guidance for the Establishment, Use, and Operation of Conservation Banks, May 2, 2003.

In a memorandum dated May 2, 2003, the U.S. Department of the Interior's Fish and Wildlife Service issued guidance on establishing, using, and operating conservation banks. This federal guidance, which closely parallels the 1995 federal mitigation banking guidance, discusses the relationship between mitigation and conservation banking and establishes criteria for developing and using a conservation bank, including provisions for long-term management, monitoring, and a detailed conservation bank agreement. In essence, conservation banking transfers the mitigation banking concept to endangered and threatened species conservation.

In contrast to mitigation banks, which offset adverse impacts to wetlands and other aquatic resources, conservation banks, also known as habitat banks, offset adverse impacts to natural resources that are typically associated with species listed under the Endangered Species Act. The natural resources associated with conservation banks are not necessarily aquatic in nature. Like mitigation banks, conservation banks represent a market-based approach to implementing high-quality, larger-scale, mitigation projects that are permanently protected.

National Wetlands Mitigation Action Plan, December 24th, 2002.

In conjunction with the release of Regulatory Guidance Letter 02-02, the Corps and other federal agencies jointly issued the National Wetlands Mitigation Action Plan (NWMAP) on December 24, 2002. The NWMAP is a comprehensive set of actions that these federal agencies are undertaking to improve the ecological performance of compensatory mitigation under the Clean Water Act and related programs, and to help ensure the effective restoration and protection of our nation's wetlands.

The NWMAP was developed in response to studies by the National Academy of Sciences and General Accounting Office that concluded that the national goal of no net loss of wetlands was not being met for wetland functions through compensatory mitigation. Action items in the NWMAP include clarifying current mitigation policy on such issues as the use of in-kind vs. out-of-kind mitigation, the use of on-site vs. off-site mitigation, and the use of preservation and vegetated buffers as mitigation; integrating compensatory mitigation into a landscape context; improving data collection and availability; building a national database to more effectively track the success of mitigation projects; and developing performance standards that better measure the success of mitigation at replacing lost aquatic functions

Executive Order 11988, Protection of Floodplains

Since wetlands can often be found in floodplains and losses of those wetlands can adversely affect the functions of the floodplain, some projects may need to be evaluated in the context of floodplain management.

Executive Order 11988, enacted May 24, 1977, requires federal agencies to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains" and "avoid direct or indirect support of floodplain development wherever there is a practicable alternative." In carrying out these directives, the Corps must consider "alternatives to avoid adverse effects and incompatible development in the floodplains" during its permit application evaluation process. Those activities that the Corps finds could not practicably avoid impacting floodplains must be designed or modified as necessary to minimize their potential harm to the floodplain.

Executive Order 13112, Invasive Species

Enacted February 3, 1999, Executive Order 13112 requires each federal agency whose actions may affect the status of **invasive species** to take a number of proactive steps. These include: identifying such actions; using relevant programs and authorities to prevent invasive species introductions; detecting and responding rapidly to control populations of such species in a cost-effective and environmentally sound manner; monitoring invasive species populations accurately and reliably; providing for restoration of native species and habitat conditions in invaded ecosystems; conducting research on invasive species; developing technologies to prevent introduction and provide for environmentally sound control of invasive species; and promoting public education on invasive species. In addition, the Order instructs agencies not to authorize, fund, or carry out actions that it believes are likely to cause the introduction or spread of invasive species. In carrying out this Order, the Corps and other federal agencies must ensure that compensatory mitigation activities do not establish new populations of invasive species or facilitate the spread of existing populations.

Executive Order 11990, Protection of Wetlands

Executive Order 11990, enacted May 24, 1977, requires federal agencies to "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." In carrying out these directives, federal agencies must avoid undertaking or providing assistance for new construction located in wetlands unless there is no practicable alternative to such construction and the proposed action includes all practicable measures to minimize harm to wetlands, taking into account factors relevant to the proposal's effect on the survival and quality of wetlands. These factors include: (1) public health, safety, and welfare, including water supply, quality, recharge and discharge; pollution; flood and storm hazards; and sediment and erosion; (2) maintenance of natural systems, including conservation and long term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber resources; and (3) other uses of wetlands in the public interest, including recreational, scientific, and cultural uses.

Guidelines for Implementation of Compensatory Mitigation Requirements for Conversion of Wetlands to Cranberry Bogs

In 1998 the Corps, Ecology, EPA, and USFWS published this guidance, which is still in effect. The Corps and Ecology regulate the expansion of existing, and creation of new, cranberry operations in wetlands under §404 and §401, respectively, of the CWA. In 1992, the Corps created a special Nationwide Permit (NWP 34) for expansion of existing cranberry bogs of up to 10 acres; new operations must be processed under the Corps Individual Permit Process. In addition to restoration, creation, and enhancement, the cranberry guidance allows for the preservation of mature forested and scrub shrub wetlands as compensation for the conversion of bogs to cranberry production. The agencies allowed a more flexible approach to preservation because 1) cranberry bogs are still wetlands, although their habitat and water quality functions are lower; 2) mitigation opportunities in Pacific and Grays Harbor County are very limited; and 3) mature forested and scrub shrub wetlands are very much at risk in the cranberry producing counties.

State Policies and Guidance

Alternative Mitigation Policy Guidance for Aquatic Permitting Resources, Ecology Publication # 03-06-007.

Washington State's Alternative Mitigation Policy Guidance describes how the Departments of Ecology and Fish and Wildlife implement their policies regarding mitigation for aquatic resources. The policy guidance was developed through a cooperative effort between the Washington departments of Community Trade and Economic Development, Ecology, Transportation, and Fish and Wildlife, and interested Tribes as directed under the Salmon Recovery Act, Chapter 75.46 RCW. The Alternative Mitigation Policy provides guidance on the factors and preferences used by each agency in determining when alternative mitigation options are preferable to on-site and in-kind compensation. The Alternative Mitigation Policy Guidance is consistent with the requirements under the state's Aquatic Resources Mitigation Act (Ch. 90.74 RCW).

DRAFT State Wetland Banking Rule

In January 2001, Ecology published its draft rule for a certification program for wetland mitigation banks pursuant to the Wetlands Mitigation Banking Act (Ch. 90.84 RCW). Although the rule was withdrawn prior to its adoption, Ecology uses it as its primary guidance for the review of wetland bank proposals. The draft rule outlines the review and approval process for mitigation banks, and provides technical guidance on designing and constructing a wetland mitigation bank. The draft state rule is consistent with the 1995 federal guidance for wetland mitigation banks.

In July 2004, the department will implement a pilot rule project to test the implementation of the draft bank certification rule. Check the Ecology Wetland Banking Home Page for the most recent information on the status of the bank certification rule.

Governor's Executive Order 89-10, Protection of Wetlands

This executive order, signed by Governor Booth Gardner in December of 1989, established an interim goal "to achieve no overall net loss in acreage and function of Washington's remaining wetlands base," and a long-term goal of increasing acreage and function of the state's wetland resources. Further, the order directed Ecology to develop guidance that would "lessen the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands" (see p. 55, What does "No Net Loss" Mean?).

Governor's Executive Order 90-04, Protection of Wetlands

This executive order, signed by Governor Booth Gardner in April of 1990, directed all state agencies to use their existing authorities to protect wetlands. In particular, the order directed state agencies to use their SEPA authorities "to the extent legally permissible, to require mitigation of wetland impacts for all agency actions affecting wetlands." Executive Order 90-04 also defines mitigation and directs state agencies to implement the process of mitigation in sequential order (see p. 37, What is Mitigation Sequencing?).

USING A LANDSCAPE-BASED APPROACH TO COMPENSATORY MITIGATION

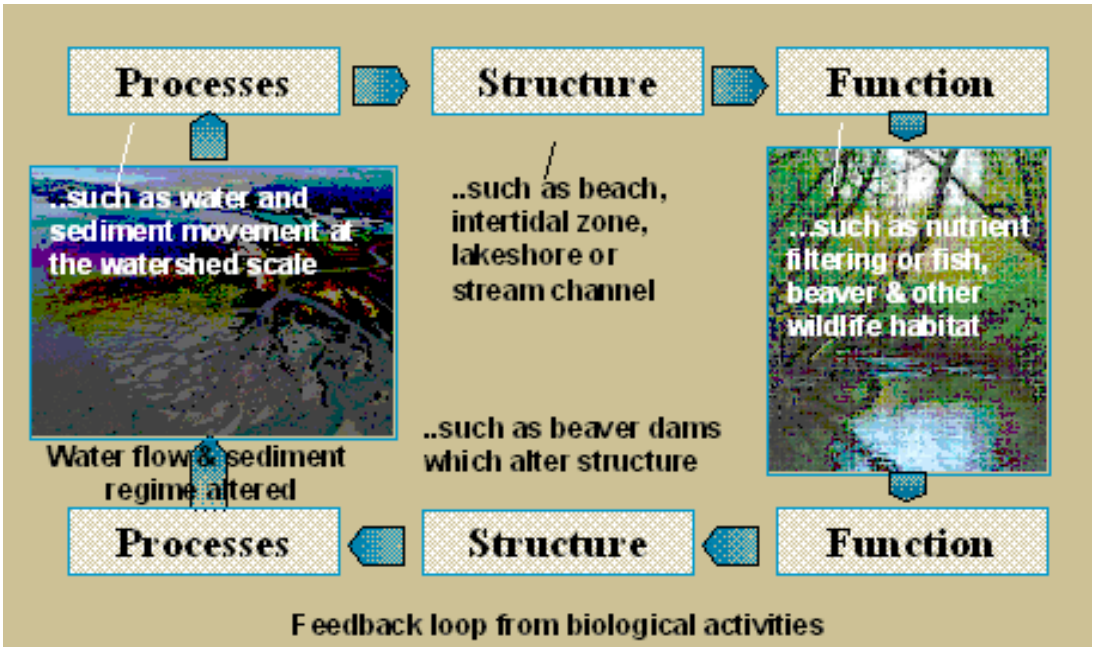
There is a growing body of science showing how watersheds and ecosystems function as entire systems. Actions in one portion of the landscape can produce effects in other (downstream) areas of the landscape.

Changes in land-use significantly affect the types and distribution of ecosystems and **environmental processes** within watersheds. Despite the significance of land-use decisions at the landscape-level, the larger environmental process considerations are rarely included in land-use planning decisions (Dale et al. 2000). While environmental processes occur over the private and public landscape, resource decisions, particularly wetland management decisions, are made at the site scale. Individual decision-making focused on the site level often conflicts with the landscape approach to resource management (Race and Fonseca 1996).

Wetlands are reflections of the interaction between climate, water, geology and topography. The type of soils, the permeability of the soils and the landforms all affect how water moves through the landscape (Bedford, 1996). Wetlands form where the shape of the land allows water to pool at or near the surface of the ground (depressional wetlands), at the intersection of different soil layers where water flows laterally between layers due to differences in permeability, areas where there are breaks in the topography and subsurface flows are exposed (slope wetlands), and areas where surface waters regularly flow due to increased precipitation causing flooding (riverine wetlands).

Due to growing understanding of landscapes and **environmental processes** which affect the long term patterns of ecosystems and functions on the landscape, and the documented shortfalls to how compensatory mitigation has been done in the past, a shift in emphasis for wetland mitigation is occurring. The change in emphasis has moved from a site-based focus to a more holistic view of the landscape and how wetlands and compensatory wetlands fit into and contribute to the larger landscape.

Aquatic habitat is an expression of larger landscape processes……



Historically, most wetland regulatory programs and decision-making on compensatory mitigation has focused on wetlands as individual sites, unrelated to the rest of the landscape. This approach has resulted in fragmented wetland systems and wetland sites which are cut off from energy and water processes in the landscape and habitat connections.

Compensatory mitigation, as it has been practiced, relies more upon opportunistic identification of available sites rather than focusing the site selection and design for the compensation in the larger context of the functioning and restoration of watersheds. The emphasis for concurrent mitigation has been on attempting to replace functions and area at the site level, often ignoring considerations of whether or not the compensation will provide ecologically significant benefits to the larger landscape. Compensation sites have been selected based primarily on their availability and proximity to impact areas.

The National Research Council report (NRC 2001) on "compensatory" wetlands recommends that when agencies are making decisions on permits and compensation that they review the wetland in the context of its relationship to the landscape and other ecosystems. Some of these considerations include:

- How the wetland relates to the flow of water through the watershed, above and below ground;
- The importance of the site for habitat functions, such as whether the site provides important breeding or rearing habitat and connectivity for species distribution;
- The importance of the wetland's location for water quality functions;
- How the site contributes to restoring or maintaining water flow patterns in the landscape; and
- How upslope and adjacent land use will affect the future condition of the site.

The NRC report emphasizes that on-site replacement of wetlands is not always the preferred option for mitigation and that the most ecologically beneficial alternative should be given preference.

Policy Context

Policies at the state, federal and local levels reflect the growing acceptance of a more holistic and landscape-based approach to wetland management and regulatory decision-making. Examples include the state's policy guidance on alternative mitigation, the national wetlands action plan, and the Corps regulatory guidance letter (RGL 02-02) on compensatory mitigation.

In response to the National Research Council's national study of wetland mitigation (NCR 2001), the Corps released RGL 02-02 in late 2002. Concurrent with the issuance of RGL 02-02, the National Wetlands Mitigation Action Plan was released.

The Plan directs the federal resource agencies to use a landscape-based approach when evaluating compensation proposals. It also directs the federal agencies to work with states and tribes to update guidance on compensatory wetland mitigation. *Through this document, the Seattle District of the US Army Corps of Engineers, EPA Region 10, and Ecology are updating their guidance on compensatory wetland mitigation in Washington.*

The State's alternative mitigation policy guidance describes the considerations used by the departments of Ecology and Fish and Wildlife to evaluate whether an alternative form of mitigation is environmentally preferable to on-site/in-kind replacement. The guidance in the document assists regulators and applicants in selecting compensatory mitigation options that are appropriate for the watershed and most likely to provide sustainable ecological benefits.

The listing of several species of salmon accentuated the need to more integrated decision-making and much of the recent research into watershed functioning and health has been driven by salmon recovery needs.

What is a Landscape-Based Approach to Mitigation?

A landscape-based approach to mitigation means evaluating proposed impacts as well as selecting compensatory mitigation in the context of the larger landscape. It involves determining the relative importance of a wetland or aquatic system in relationship to other wetlands, habitats and processes occurring in the landscape. In order to do this, one has to change their perspective from a narrow site-based focus to a wider focus which takes in the surrounding landscape and the environmental processes.

In thinking about a landscape-based approach, it might be helpful to think about it as looking at a site from farther and farther away. The wider your field of vision, the more you can see. Patterns and relationships between water, geology and plant and animal communities become more apparent. For example, assume that you are evaluating a proposed commercial site. Looking at just the site, you may determine that the riparian community on a parcel of land is highly degraded and providing minimal functions. However, if you step back and look at the same site in the context of the river basin, it becomes evident that the site is part of a relatively intact riparian corridor and that the restoration of the riparian area on the site would restore connectivity between riparian areas. Conversely, the loss of the riparian area on the site could isolate part of the riparian system and eliminate a travel corridor and ability of animals to disperse to other habitats.

What are Environmental Processes?

Environmental processes are the conditions that control long-term patterns of structures, ecosystems and functions in the landscape. These include the movement of water, sediment, nutrients, energy, plants, and animals in the landscape, and the factors that control this movement - climate, geology, soils, and topography.[10] A landscape approach requires developing an understanding of *how* and *where* various environmental processes occur.

Environmental processes take place over large areas of land and serve to shape and support the habitats and ecosystems typical for the region. Rain falls in the upper reaches of a basin and part of the precipitation is absorbed by vegetation and soils while other flows run off over the surface and into surface waters. As gravity pulls the waters down stream the flows pick up and carry sediments, wood and detritus. Environmental

[10] For more detailed information on watershed processes, see "*Restoring Watersheds at a River Basin Scale,* Gersib 1997; and Volume 2 of the Best Available Science for wetlands (when available – currently in draft.)

processes drive the distribution of water, sediments, nutrients, habitats and wildlife in the landscape forming the structure and function of specific ecosystems within a watershed, including wetland systems. Along with the movement of water and other elements, another environmental process, natural disturbance, provides important diversity and opportunities for colonization by plants and wildlife.

Ecosystems are dynamic and both minor disruptions and catastrophic events are crucial for maintaining the health and habitats in watersheds. Catastrophic floods and mass wasting can result in flushing of river bed sediments, development of new pool and riffle complexes, addition of new large woody debris and movement of the main river channel, and creation of new side channels. Wind storms can fall large conifers creating openings in the forest canopy allowing more sun tolerant species to colonize.

Note: When designing a mitigation site, keep in mind what natural disturbances are likely to occur on that site – e.g. flood events (typical and extreme) or fire, - and plan accordingly.

Examples of landscape based mitigation alternatives

Landscape-based mitigation focuses on developing compensatory mitigation sites that will provide important functions in the watershed and restore and maintain environmental processes. Landscape-based mitigation can complement and help implement watershed plans.

Watershed planning efforts may identify and prioritize restoration sites based on the identified needs in a watershed and the degree of ecological contribution achievable on the sites. However, these sites may not be available for restoration or use as compensation sites. The small size of required compensation (generally < 2 acres) often does not provide sufficient incentive for applicants to obtain and restore sites identified as priority sites for watershed restoration. However, these priority sites can be restored and used to offset minor losses of wetland area and function when they are restored of as part of a mitigation bank, in lieu fee project or other consolidated mitigation project.

Another example is when a landscape approach is used to decide how authorized impacts in urbanizing areas are addressed. If a jurisdiction inventories its existing resources and identifies where development is likely to occur it can also identify important areas for: maintaining environmental processes; restoring natural corridors; and unique habitats for protection. When wetland losses occur in their urban areas, suitable alternatives for offsetting small impacts can be identified such as the purchase of mitigation credits from an approved wetland mitigation bank, the preservation of wetland tracts, and restoration of stream corridors to provide connectivity and migratory routes for wildlife.

Patterns of urban growth often disconnect and disrupt natural systems and corridors. The restoration of key corridors traversing the urban area provides dispersal areas for wildlife and valuable green space systems for urban residents. Alternatives in which compensatory mitigation contributes to the functioning of the larger landscape are more preferable than simply attempting to replace acreage on site.

HOW DOES WETLAND MITIGATION INTEGRATE WITH THE ENDANGERED SPECIES ACT?

Many of the activities that destroy or degrade wetland functions also adversely impact species listed as threatened or endangered under the Endangered Species Act – ESA (33 USC §§ 1531 et seq., see p. 9 Federal Laws and Rules). As a result, the regulatory agencies often give special consideration to the specific needs of these federally protected species when determining what compensatory mitigation will be required of permit applicants. Even before considering compensatory mitigation, the regulatory agencies often apply more stringent standards for avoiding and minimizing impacts to the aquatic environment and ESA-listed species, especially when the activity would degrade or destroy habitat that is difficult or impossible to replace. Typically, requirements for compensatory mitigation for projects involving ESA-listed species will include elements that simultaneously address impacts to both wetland functions and endangered species and their habitat.

In addition to using the mitigation sequence (avoid, minimize, compensate) to protect aquatic areas that are used by ESA-listed species; Section 7 of the ESA places additional requirements on projects when federal entities or actions are involved. Prior to taking any action that may affect a species listed (or proposed for listing) as threatened or endangered under the ESA, Section 7 requires federal agencies and departments to consult with the National Marine Fisheries Service (NOAA Fisheries) and/or the U.S. Fish and Wildlife Service (USFWS). Consultation is also mandated if the action would destroy or adversely modify designated critical habitat for a listed species. This requirement applies to the Corps when it issues a CWA § 404 permit. In a process somewhat analogous to mitigation sequencing, Section 7 consultations usually result in the identification of measures that would minimize the impacts of a proposed action on ESA-protected species and their critical habitat. As a result, the consultation process often gives the NOAA Fisheries and/or USFWS considerable influence over the nature and extent of compensatory mitigation required by the Corps in cases where federally listed species are involved.

Protecting habitat is a common form of compensatory mitigation associated with ESA-listed species. As such, larger consolidated mitigation projects, like mitigation banks, can often provide very effective mitigation for ESA-listed species (see p. 97, Programmatic Mitigation). Recognizing this, in 2003, the USFWS issued a set of comprehensive federal guidelines intended to promote and guide the development of conservation banks. Similar in many ways to wetland mitigation banks, conservation banks are lands (usually large tracts) acquired by third parties to be managed specifically for endangered species and protected in perpetuity by conservation easement. Like mitigation banks, conservation banks may develop and sell credits to offset adverse impacts to endangered species that occur elsewhere. In contrast to mitigation banks, conservation banks need not target aquatic resources.

The next section helps to identify which laws may apply to your project and which agencies you should contact.

For most projects affecting wetlands, you should contact the Corps, Ecology, and your local jurisdiction. Remember that while a wetland may not be regulated by one agency, it may be protected by another agency.

WHAT IF MY PROJECT AFFECTS A WETLAND?

How do I determine which agency regulates my project?

The following three tables illustrate which laws may apply to a project and the agency responsible for implementing the law or rules.

Table 1: Federal Laws /Permits commonly applicable to activities in wetlands

Law	Implementation	Jurisdiction	Application to Wetlands	Implementing Agency
Federal Clean Water Act Section 404	Permit required for discharge of dredge or fill materials including any related draining, flooding, excavation, and mechanical land clearing.	Waters of the United States	Includes all wetlands (with some exceptions)	*United States Army Corps of Engineers/ Environmental Protection Agency*
Federal Clean Water Act Section 401	Certification that the proposed project will meet state water quality standards is a condition of federal permits approval	Federal permits affecting waters of the U.S., including wetlands	Includes all wetlands that may be affected by a federally permitted activity	*Washington Department of Ecology/ EPA on tribal lands and Nat. Parks*
Federal River and Harbor Act of 1899 Section 10	Permit required for all construction activity	Navigable waters to the mean high water mark of tidal waters and the ordinary high water mark (OHWM) of fresh water	Wetlands within the limits of "navigable waters"	*United States Army Corps of Engineers*
Federal Coastal Zone Management Act	A notice of consistency with the state coastal zone management plan is a condition of federal activities, federal license and permit approval, and federal support of local activities	Applies to Washington's 15 coastal counties[11]	Wetlands within the 15 coastal counties of Washington	*Washington Department of Ecology*
National Environmental Policy Act (NEPA)	Federal process which requires full disclosure of potential impacts associated with proposed actions	All federal actions[12] not specifically exempted	All wetlands	*Varies (usually the federal agency issuing the permit)*

[11] Washington's 15 coastal counties are: Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, Wahkiakum, and Whatcom.

[12] "Actions" includes permits, authorizations, and federal funding.

Table 2: Primary State Laws /Permits

Law	Implementation	Jurisdiction	Application to Wetlands	Implementing Agency
State Growth Management Act	Consistency with local comprehensive plans and development regulations. Various permits may be required.	All cities and counties in Washington State	Requires protection of all wetlands designated as "critical areas"	Local jurisdiction/ *Washington Department of Community Trade & Economic Development*
State Shoreline Management Act	Permits required to ensure that proposed activity complies with local shoreline master plan and the Shoreline Management Act	Shorelines of the state including streams with flows greater than 20 cfs or lakes 20 acres or larger and landward area 200 feet from OHWM or floodway; associated wetlands, river deltas and certain floodplains	Includes all land within 200 feet of the OHWM of a state shoreline. Jurisdiction may be extended to include the entirety of an associated wetland and/or floodplains	Local jurisdiction/ *Washington Department of Ecology*
State Water Pollution Control Act	Permits, orders, certifications or compliance with water quality standards	Any pollution of waters of the state	All waters of the state including wetlands	*Washington Department of Ecology*
State Hydraulic Code	Permit (Hydraulic Project Approval) required for all work	Activities affecting waters of the state	Includes wetlands that are important to fish life	*Washington Department of Fish & Wildlife*
Forest Practices Act	Permit required for tree harvest	State-owned and private timberlands	Restricts harvest activities in and around wetlands	*Washington Department of Natural Resources*

Table 3: Local Laws /Permits

Law	Implementation	Jurisdiction	Application to Wetlands	Implementing Agency
Local Laws	Consistency with local comprehensive plans zoning, ordinances, shoreline master program. Various permits may be required	As defined by local plans, ordinances, and regulations	May identify specific wetlands and performance standards	Local jurisdiction

Important Note: The Corps of Engineers, not applicants or their consultants, has authority to determine whether or not a wetland is a water of the U.S. and thus regulated under the federal Clean Water Act (CWA). If the Corps determines that a wetland is not subject to regulation under the CWA, applicants should be aware that these wetlands are still subject to regulation by Ecology under the State's Water Pollution Control Act as well as by local jurisdictions.

What do the laws and rules require?

Laws protecting wetlands on the federal, state and local level usually require three things for projects that are likely to damage a wetland. First, the applicant must try to avoid and minimize the impacts the greatest extent possible (i.e. apply mitigation sequencing). Second, the applicant must determine the amount of unavoidable impact. Finally, they must provide compensation for the impact (i.e. provide replacement resources). The following sections describe each of the three areas:

1. Mitigation sequencing
2. Impacts requiring compensation
3. Compensatory Mitigation[13]

What is Mitigation Sequencing?

Once a wetland determination is made, agencies require that permit applicants identify any potential wetland impacts, and many require that the applicants mitigate likely impacts of a proposed action on wetlands. Mitigation means to reduce the severity of an action or situation. Mitigation sequencing refers to the order in which different mitigation actions are used.

According to the Washington State Environmental Policy Act (Chapter 197.11 WAC), wetland mitigation involves the following sequence of steps:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts;

[13] ***Types of compensatory mitigation*** are described in following sections, while **Part 2** of this document outlines the process and requirements for ***developing a compensatory mitigation proposal***.

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

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

5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or

6. Monitoring the impact and taking appropriate corrective measures."

At the federal level, activities requiring a CWA Section 404 permit are usually subject to the same basic sequencing requirements of avoidance and minimization before the Corps and EPA consider compensation. In addition, many projects that require authorization by the Corps must comply with the CWA Section 404(b) (1) guidelines. These guidelines presume, unless clearly rebutted, that less environmentally damaging alternatives, which do not involve filling special aquatic sites such as wetlands, are available for non-water dependent activities. In addition, whether a project is water dependent or not, the guidelines presume that all practicable alternatives that do not involve a discharge into a special aquatic site have less adverse impact on the aquatic ecosystem.

The Corps' Section 404(b)(1) guidelines prohibit the Corps from authorizing a project under an individual permit unless that project would utilize the "least environmentally damaging practicable alternative" (as determined by the Corps and EPA). In some cases, the least environmentally damaging practicable alternative is the one that would relocate the project away from special aquatic sites, possibly to another site altogether. In the case of Nationwide Permits (a collection of general permits), the Corps has already performed an alternatives analysis and determined that projects which meet the conditions of the nationwide permit meet the test of "least environmentally damaging practicable alternative".

When determining the "least environmentally damaging practicable alternative" other ecosystems and habitats should be considered. For example, it may be preferable to authorize an impact to a low functioning, highly degraded wetland rather than impact a mature forested upland that provides a significantly higher level of function.

Avoidance of Irreplaceable Wetlands.
For certain rare, sensitive, and/or difficult to replace wetlands, such as bogs, fens, mature forested wetlands, eelgrass beds and habitats for endangered plant populations, avoidance may be the only mitigation option permitted except under exceptional circumstances. Refer to p. 69, What are Replacement Ratios?

What Types of Impacts Require Compensation?

The complete loss of a wetland is not the only type of impact which involves compensatory mitigation. Impacts to wetlands can range widely in the degree of an alteration and loss. Some impacts are permanent, while others include only a temporary loss of a few functions. Permanent impacts to wetlands and aquatic resources (such as filling for a building pad or roadway) usually require compensatory mitigation as a permit condition so that the functions provided by the wetland are not completely lost. However, compensatory mitigation also addresses temporary, temporal and indirect impacts to wetlands and other aquatic resources that result from project construction and operation. The regulatory agencies consider the wetland impacts in concert with the time it takes for replacement wetlands perform functions at the desired level. The overall intent and purpose of compensatory mitigation is to adequately offset all impacts to wetlands including the permanent, temporary, temporal and indirect impacts to wetlands.

Permanent impacts are described as those impacts that result in the permanent loss of wetlands and/or waters of the U.S. These types of impacts are usually related to the footprint of a fill or other impacts such as completely drained areas.

Temporary impacts (short-term effects) are those lasting for a limited time and where functions can be replaced in a relatively short period of time (about one year). Compensatory mitigation is normally not required for temporary impacts to functions if these functions can be replaced within one growing season for the impact. For example, replacing the functions (such as habitat for small mammals, water quality functions, nutrient uptake) for palustrine emergent (PEM) wetlands may be done within one growing season if the disturbance is not severe.

Temporal impacts (long-term effects) refer to those functions that can and will eventually be replaced but cannot and do not achieve similar functionality in a short period of time. Temporal impacts for replacing functions, such as song bird habitat in a tree canopy provided by a 50-year old palustrine forested wetland, may take over 20 years to develop the level of function lost at the impact site. Temporal impacts normally require compensatory mitigation and are usually reflected as an increase in the mitigation ratios required.

Indirect impacts result from activities adjacent to or upslope from an aquatic resource that may affect the way the aquatic resource functions. Indirect impacts can result from construction activities nearby (e.g. producing sediment that enters the wetland or other aquatic resource). Indirect impacts can also result from changing the hydrology in an area so there is too much or too little water after project construction, thereby changing or limiting wetland

function. A road that crosses through a wetland affects more than just the area of wetland under the road fill. The flow of water through the wetlands often changes and the road may provide a barrier to animal movement as well as ongoing disturbances. In other instances, indirect impacts occur when so much of a wetland is lost that the remaining wetland area can't provide functions at its former levels. With some functions, as wetland size diminishes the functions and values of the wetland provided by the wetland decrease. In such cases, the agencies may consider the entire wetland to be adversely impacted and compensatory mitigation will be required for both direct and indirect impacts to the wetland.

What are the Different Types of Compensation?

Once avoidance and minimization mitigation requirements have been satisfied, and an impact is determined to be unavoidable, then a project applicant is usually required to compensate for any remaining unavoidable impact to wetlands. This is known as "compensatory mitigation." For wetlands, compensatory mitigation typically involves creating new wetland area (and its associated functions) as compensation for wetland area and functions that have been or will be lost due to a permitted activity.

Compensatory wetland mitigation generally entails performing one or more of the following actions:

- *Restoring* wetland acreage and functions to an area.
- *Creating* new wetland area and functions.
- *Enhancing* functions at an existing wetland.
- *Preserving* an existing high quality wetland to protect it from future loss or degradation.

Important Note:
Compensatory mitigation is not considered until all appropriate and practicable avoidance and minimization has been accomplished.

How are the Different Types Defined?

Until recently, the types of compensatory mitigation have been divided into four general categories; creation, restoration, enhancement and preservation. In its Regulatory Guidance Letter 02-02, the Corps of Engineers redefined the basic types of compensatory mitigation based on the type of activity and whether the compensation will result in net gains in acres or functions. For consistency, Ecology has adopted the Corps' definitions of the types of compensatory mitigation. However, the terms creation and preservation are used in lieu of "re-establishment" and "protection/maintenance", respectively, since those terms are widely understood and used in wetland mitigation. The different types of compensatory activities are defined as follows:

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into:

> ***Re-establishment***: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a

former wetland. Activities could include removing fill material, plugging ditches, or breaking drain tiles. Re-establishment results in a gain in wetland acres and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions and processes of a degraded wetland. Activities could involve breaching a dike to reconnect wetlands to a floodplain, restoring tidal influence to a wetland, or breaking drain tiles and plugging drainage ditches. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres.

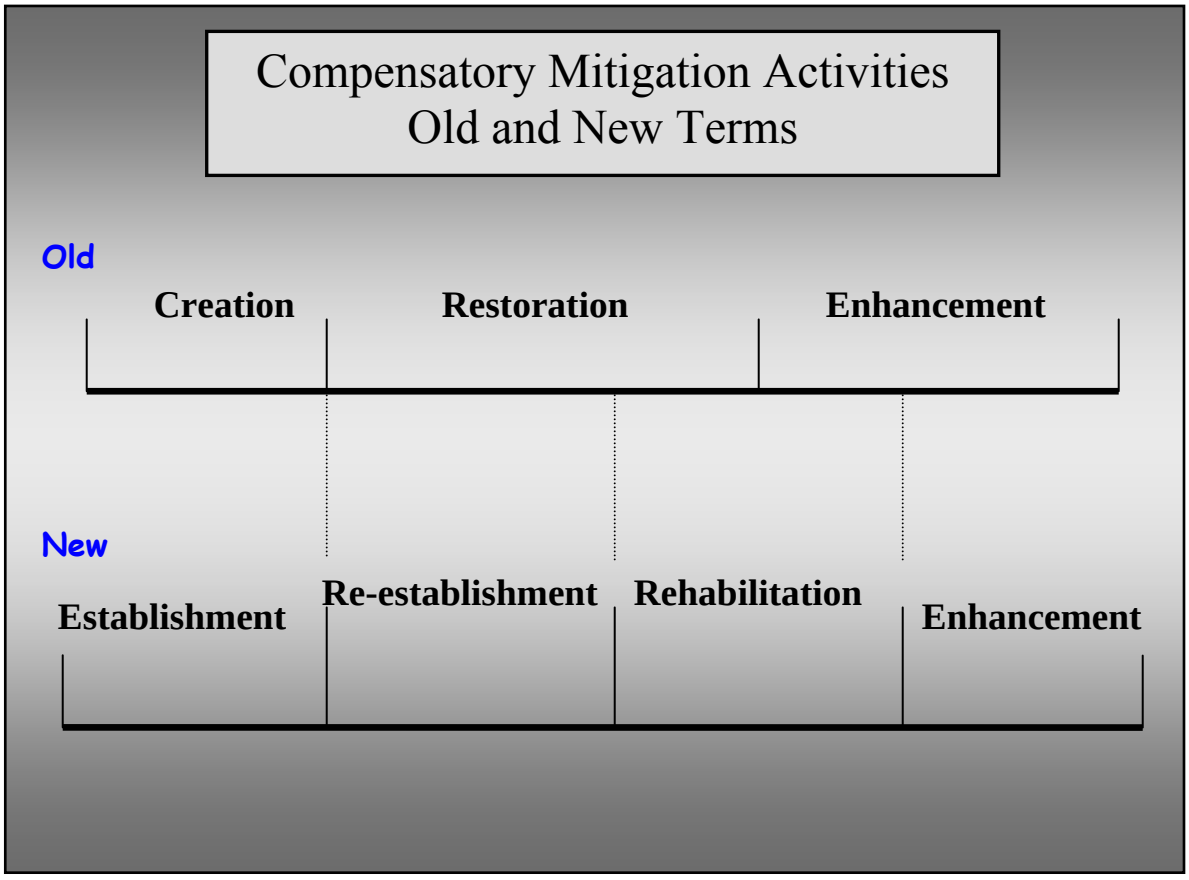
Creation (Establishment): The manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deepwater site, where a biological wetland did not previously exist. Activities typically involve excavation of upland soils to elevations that will produce a wetland hydroperiod, hydric soils, and support the growth of hydrophytic plant species (Gwin et al. 1999). Establishment results in a gain in wetland acreage and function.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of a biological wetland to heighten, intensify or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention or wildlife habitat. Activities typically consist of planting vegetation, controlling non-native or invasive species, modifying site elevations to result in open water ponds, or some combination of these. Enhancement results in a change in wetland functions and can lead to a decline in other wetland functions. It does not result in a gain in wetland acreage.

Preservation (Protection/Maintenance): The removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This term includes the purchase of land or easements, repairing water control structures or fences, or structural protection. Preservation does not result in a gain of wetland acres, but it may result in a gain in functions over the long term.

The following figure illustrates how the old and new terminologies overlap. (*Note*: Preservation has the same definition in both systems and is omitted from the graphic below.) The key difference in the terminologies is in the area of restoration and enhancement. Some activities that used to be designated as enhancement may be considered rehabilitation (a form of restoration) under the new terminology. (see p. 47 "What is the distinction between rehabilitation and enhancement?" for more information.)

Figure 1. Comparison of old and new federal compensatory mitigation terms.



What Types of Wetland Compensation are Preferred?

Simple definitions do not indicate of what type of compensatory wetland mitigation projects regulatory agencies would like to see. This section describes the advantages and disadvantages of different types of compensation and the general level of acceptance by the agencies for different compensation activities. The descriptions for the types of compensation activities are listed in the order of preference.

Restoration (Re-establishment and Rehabilitation)

Restoration, including both re-establishment and rehabilitation[14], should be the first choice for compensation, whenever possible. The Operational Guidelines for Creating and Restoring Wetlands that are Ecologically Self-Sustaining (National Research Council 2001) state that restoration "has been observed to be more feasible and sustainable than creation of wetlands. In restored sites the proper substrate may be present, seed sources may be on-site or nearby, and the appropriate hydrological conditions may exist or may be easily restored." In addition the MOA between the Corps and EPA declares that, "because the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, restoration should be the first option considered."

In reality, restoration of freshwater wetlands has not been used as much as creation in Washington. Restoration is likely not used very frequently because most wetland impacts are relatively small (less than 2 acres), and it is very difficult to find restoration opportunities for small sites that are not cost prohibitive. Restoration is typically most feasible and cost effective when done over a large area. Previous regulatory requirements directed applicants to provide compensation on-site, which often excluded an opportunity for restoration (Sheldon et al. 2003).

There may be greater opportunities to perform rehabilitation than re-establishment. While re-establishment uses a site which is no longer wetland, rehabilitation involves a site which is still a wetland. The site, however, is usually a highly degraded wetland because one or more environmental processes supporting the site have been disrupted. Rehabilitation often involves actions that substantially "restore" the hydrologic processes or natural water flow patterns to a wetland which has been altered as a result of human activities. For example, rehabilitation can involve breaking drain tiles and/or plugging ditches to stop the rapid removal of water from a site and restore a wetland that contributes to subsurface flows and groundwater recharge and/or discharge. Rehabilitation and enhancement are similar since both activities use sites with existing wetlands. See p. 47 "What is the distinction between rehabilitation and enhancement?" for more discussion.

[14] **Re-establishment** involves *restoring functions* to an area which was formerly a biological wetland but no longer provides wetland functions. On the other hand, **rehabilitation** involves the *improvement or repairing* of the performance of functions in a biological wetland which is highly degraded.

Creation (Establishment)

In Washington State, a recent study found wetlands created from uplands to be relatively successful. For example, 60% of created wetlands were either fully or moderately successful, while only 11% of enhanced wetlands were moderately successful and none were fully successful (Johnson et al. 2002). Furthermore, many created wetlands resulted in significant gains in water quality and quantity functions (Johnson et al. 2002). Creation, like restoration, results in a gain in wetland area and function. Creation, therefore, is preferred second to restoration for compensation. This preference, however, only applies when the created wetland is proposed for an appropriate position in the landscape, such as adjacent to an existing wetland. ***Landscape position and proximity to a reliable water source are critical for the success of creation projects and cannot be over emphasized.***

The National Research Council (NRC) made several recommendations that should improve the effectiveness of created wetlands and increase the likelihood that mitigation proposals involving creation will be successful. First, "avoid over-engineered structures in the wetland design" (NRC 2001). This includes constructing **atypical wetlands** and water control structures, such as berms and weirs that will require repairs and intensive maintenance. Second, "restore or develop naturally variable hydrological conditions," (NRC 2001). This means that water inputs for compensation wetlands should take advantage of natural water flow patterns, such as overbank flooding in a riverine setting or groundwater discharge in a slope or depressional setting. To be successful, creation projects need to be self-sustaining and relatively maintenance free.

Enhancement

The enhancement of existing wetlands has been widely used in compensatory mitigation. Usually, enhancement involves attempts to change plant communities from non-native emergent to native scrub-shrub or forested communities. Frequently, it includes attempts to remove and control "undesirable" invasive species such as reed canarygrass (*Phalaris arundinacae*), blackberry (*Rubus procerus*), and purple loosestrife (Lythrum salicaria) through a variety of methods (burn, till, spray, etc.) followed by planting of woody species. Occasionally, enhancement includes changes to the site's water regime through excavation, construction of weirs, or removal of ditches and drains.

Many entities have expressed concern over the use of enhancement as the sole method of compensating for wetland loss because it results in a net loss of wetland area. However, these concerns have been countered by the view that a net gain in functions from enhancement could adequately compensate for wetland loss. A recent study of mitigation in Washington State (Johnson et al. 2002) raises new questions and concerns about the relative success and value of enhancement as a compensation approach. The concerns raised from the study include the following:

- A high percentage of attempts to control non-native invasive plants and establish woody plant communities fail.
- Most enhancement actions focus on improving vegetation structure and ignore improvement in environmental processes that support wetland systems and functions.
- Assessments of the gain in functions from vegetation enhancement alone indicate a net loss of water quality and quantity functions and only modest gains in habitat functions.

Clearly, enhancement has a place in the "mitigation toolbox". However, a wide range of activities with greatly varying degrees of ecological contribution have been lumped under the heading of enhancement. It is important to differentiate between different kinds of enhancement activities and determine the appropriate level of benefit from each type of activity.

Preservation

Preservation of wetlands, aquatic areas, and important upland can be used as compensation in exceptional circumstances. While preservation activities do not provide any new wetland acreage, preservation can be extremely beneficial if it facilitates the permanent protection of wetland areas that would otherwise not be protected (see p.66 Long-term Protection). Protecting high functioning wetlands can provide a long-term maintenance of wetland functions that could otherwise be lost. This is particularly true of mature and old growth forested wetlands where trees can be harvested legally, significantly altering many of the wetland functions for decades and perhaps centuries.

The preservation of a high quality wetland in the same watershed where a wetland loss has occurred can be an acceptable form of compensation when done in combination with re-establishment, re-habilitation, creation or enhancement. There is growing awareness that landscapes function as ecological units. Actions and disruptions to the environmental processes in one part of the landscape can influence the remaining parts, affecting its ability to function as a self-sustaining ecosystem. In some cases, protecting a high quality wetland can be more beneficial to the landscape's overall quality and functioning than replacing the wetland exactly as it was. This is especially true when the wetland impacts are small and to low-quality systems and a high quality, at-risk wetland is protected for the long-term.

Preservation can have the following advantages:

a) Larger mitigation areas can be set aside due to the higher preservation mitigation ratios.

b) It can ensure protection for high quality, highly functioning aquatic systems and environmental processes that are critical for the health of the watershed that may otherwise be adversely affected.

c) Preservation of an existing system removes the uncertainty of success inherent in a restoration, creation or enhancement project.

It should be noted that preservation of wetlands does not allow applicants to circumvent the standard mitigation sequence of avoiding and minimizing impacts first. Additionally, preservation projects are subject to the same requirements as are other types of wetland mitigation: monitoring, long-term protection, and stewardship. Preservation of wetlands generally requires significantly higher ratios to offset impacts than wetland creation or restoration projects because preservation usually provides less environmental improvement per acre than the other forms of compensatory mitigation.

What is the distinction between rehabilitation and enhancement?

Rehabilitation and enhancement aren't separated by a distinct line. Instead, rehabilitation and enhancement actions exist on a continuum.

Rehabilitation ⟷ *Enhancement*

In general, rehabilitation involves actions which provide greater gains in a whole suite of functions both at the site- and landscape-scale (*more effective actions*.) Rehabilitation actions often focus on restoring environmental processes that have been disturbed or altered by previous or ongoing human activity. Enhancement typically involves actions that provide gains in only one or a few functions (less effective actions.) Enhancement actions often focus on structural or superficial improvements to a site and generally do not address larger scale environmental processes.

Rehabilitation and enhancement activities blend into each other. On a specific project, it might be difficult to determine if the proposed compensation is rehabilitation or enhancement. The following table describes some possible actions proposed for compensation. The table identifies how effective those actions would be in terms of gain in functions. Generally, the more effective actions require lower ratios to adequately offset authorized impacts (See pp. 69 for a discussion of replacement ratios). The agencies are responsible for determining whether any specific proposal would be considered rehabilitation or enhancement.

Table 4. Examples of compensation actions and their relative effectiveness

More effective actions *(greater performance of functions & sustainable)*	**Less effective actions** *(lower gain in function & may not be sustainable)*
Restore Water Processes by reinstating subsurface/return flow for depressional & slope wetlands; tidal waters for estuarine wetlands; overbank flooding or flow through from riverine source for riverine wetland.	Partially restore or incorrectly restore water flow and/or focus on enhancing the structure of the wetland area which may not be supported by the existing water regime (underplanting in existing scrub-shrub area)
Restore to **HGM** Class Appropriate for Landscape Setting.	Atypical Wetland or Incorrect Wetland Class for Landscape Setting
Remove Stressors, such as water diversions, intensive agriculture, logging, clearing and grading, urban uses, and discharges from non-point sources.	No changes to the stressors (i.e. no BMPS applied).
Design wetland mitigation in accordance with upslope or upstream processes present. In other words, don't design a wetland for amphibian habitat in a flashy urban hydrologic regime.	Design wetland mitigation based solely on the type of habitat or physical structure desired/proposed without consideration of the existing landform, HGM setting, or hydrologic processes.

Table 5 provides some examples of alterations or disturbances that may have occurred on your site due to prior activities. The table describes general actions that could be carried out if the site were proposed for compensation. Some of the actions are considered more effective while others are considered less effective. As with Table 4, more effective actions would generally provide greater gains in the performance of functions and are more likely to be sustainable in the long term. In most cases, the more effective actions should be used.

Table 5. Examples of site alterations and the relative effectiveness of compensation actions to address those alterations.

Site Alterations Due to Prior Activities	**Actions to Address Alterations or Disturbances on Areas Proposed as Compensation Sites**	
Type of Alteration	**More Effective**	**Less Effective**
Diking	Remove dikes *(generally considered rehabilitation)*	Partial or no removal of dikes (may result in fish stranding)
Tiling	Break all tiles *(generally considered rehabilitation)*	Partial or no removal of tiles
Ditching	Plug all ditches *(generally considered rehabilitation)*	Partial or no removal of ditches
Channelization	Regrade stream channel to proper curve amplitude and frequency and ensure that stream will overbank flood (at approx 1.5 yr frequency) into adjoining floodplain (i.e. stream or river is not incised)	Stream or river remains incised and/or no overbank flooding occurs with redesign of channel
Stormwater Inputs	Treat and introduce as subsurface flow (i.e. infiltration through buffer)	Stormwater is treated but introduced as unregulated point source.
Weirs/Tide Gates	Remove	Lower outlet height without achieving natural hydroperiod of wetland (for tidal wetland fish stranding and flushing problems; for riverine wetlands overbank flooding is limited)
Utilities - pipelines, sewers, waterlines	Remove abandoned utilities or relocate active lines	Try to restore natural water regime by installing collars on subsurface utilities to prevent draining away of water along utility line; or install subsurface permeable corridors to allow passage of water perpendicular to utility line (eliminates ponding on one side and drying out on the other) (reduced impact). No remediation
Tilling/plowing	Stop tilling/plowing	Continue tilling and plowing (greatest impact)
Soil compaction	Scarification and addition of organic material (mulch)	No measures except planting and grading (greatest impact)
Soil contamination	Remove and replace hydric soils	Contamination is not removed either through remediation or replacement of soils

Type of Alteration	More Effective	Less Effective
Soil/surficial geological alteration	Maintain or restore natural soil and surficial geo structure (e.g. impermeable layers, organic soils, recharge layers)	Puncture impermeable layers, excavate organic soils, put in impermeable layer (pond liner) in recharge area)
Removal of all vegetation/ clearing	Revegetate and install necessary erosion control measures (hydroseed, natural materials mulching, natural matting - no plastics -) and control invasives preferably without herbicides.	Revegetate without control of invasive species. Under planting alone, insufficient maintenance of planted site
Grazing	Remove grazing/mowing and control invasives. May need to replant areas to "jump-start" succession process but evaluate site by site.	Continue grazing use controls and create buffer strips and fencing to limit erosion/sedimentation and access to flowing and open water (reduced impacts); or continue grazing with no restrictions (greatest impacts)
Mowing	Stop mowing, control invasives - same measures as above	Continue mowing but impose BMPs and other restrictions including buffer strips on stream/river edges and open water areas (reduced impacts); Continue mowing with no controls (greatest impacts).
Logging	Revegetate with scrub shrub & appropriate pioneer forest species (e.g. willow and cottonwood planted first followed with subsequent plantings of cedars and other conifers)	Revegetate with inappropriate species or inappropriate timing (plant later successional species immediately) (reduced impacts). No planting (greatest impacts but evaluate each site for best approach)

Why is Preservation acceptable for mitigation? [15]

The preservation of a high quality wetland (such as a mature forested wetland, native sedge community, or vernal pool) in addition to restoration or creation can provide significant ecological benefits. Preserving high quality and well functioning wetlands protects the functions being performed by those wetlands from being lost in the future. Native species disperse from mature wetland areas into adjacent habitats, particularly

[15] The section on preservation was adapted from State of Washington Alternative Mitigation Policy Guidance (2000). Ecology Publication # 03-06-007.

restored and created wetlands. Seeds dispersed from a preserved site can colonize the creation site and animals may move on to the site from the preservation area. When preservation is part of a compensatory mitigation project, the preserved wetland can help to increase the quality of the created wetland and reduce the time for the replacement wetland to start to provide functions. In urban areas where wetlands are under considerable threat of loss and degradation from increasing growth, the protection of wetlands and riparian areas can protect travel corridors for wildlife and urban green space.

The regulatory agencies have accepted mature forested wetlands, mature scrub/shrub systems and open native meadows for preservation credit.[16] Under existing federal and state laws, trees can be legally harvested from forested wetlands. While the harvest does not result in a loss of wetland area, it does result in a loss of wetland functions. Vernal pool complexes in Eastern Washington may also be suitable for preservation, particularly if they are small enough to meet the exemption criteria in local wetland ordinances. In the case of vernal pools, the applicant would need to preserve the adjacent uplands as part of the mitigation package to protect their habitat and hydrologic functions.

When evaluating preservation sites, take into consideration the anticipated future land uses around the preservation site to ensure that the preserved wetland won't be degraded over time. Things that can degrade the preservation site and its ability to function include:

- Storm water runoff – water level fluctuations and pollution
- Fragmentation – isolation from other habitat areas
- Grazing - if carefully managed, grazing can help rehabilitate native plant communities on the site.
- Clearing
- Dumping

Preservation proposals need to include adequate **buffer areas** to be approved the agencies. Buffer width must be adequate to protect the wetland habitat and its functions from encroachment and degradation. Future land use dictates the size and composition necessary for a buffer that is adequate to protect the wetland and its functioning. When the site for preservation contains large, diverse buffers that provide exceptional wildlife habitat, agencies may accept portions of the buffer as part of the compensation area.

[16] See Cranberry Guidance on page 23.

When can I use Preservation as compensation?

The Corps, EPA and Ecology evaluate proposals to use preservation as part of the compensation package on a case-by-case basis. Preservation is an acceptable form of compensatory mitigation when used in combination with other forms of compensation such as creation, restoration or enhancement either at the preservation site, or at a separate location. Preservation may also be used by itself, but more restrictions will apply. Preservation sites may also include non-wetland areas. Areas which provide important habitats and functions as well as those areas contributing to the functions provided by the wetland may be included as part of a preservation package.

Generally, the preservation of at-risk, **high-quality wetlands** and habitat is considered acceptable when the following criteria are met:

1) Preservation is used as a form of compensation only after the standard sequencing of mitigation (avoid, minimize, and then compensate.)
2) Creation, restoration, and enhancement opportunities have also been considered, and preservation is proposed by the applicant, and approved by the permitting agencies as the best mitigation option.
3) The site is determined to be under imminent threat – i.e. the preservation site under demonstrable threat of loss or substantial degradation by on-site or off-site activities that are not regulated.
4) The area proposed for preservation is high quality or critical for the health of the watershed or basin due to its location.

What types of wetlands make "high quality sites" for preservation?

Preservation sites should be wetlands that provide important functions for the watershed (see criteria below for determining whether wetland is high quality). Preservation sites that provide connectivity to other habitat areas and other aquatic sites or which are part of an open space network or natural areas and/or migration corridor are preferable. Preservation sites isolated from other habitat areas by paved areas and moderate to high intensity land uses are generally not good candidates for preservation. However, in some cases agencies may support preservation areas in urban settings in order to preserve open space and habitat for urban wildlife if the area is under demonstrable threat.

The agencies generally consider wetlands that have some of the following features as high quality sites. Not all of these criteria are required for a wetland to be considered high quality. For instance, you may have a forested riparian wetland system that isn't rare or irreplaceable, but it may be worth preserving if it contributes to the maintenance of watershed processes such as over bank flooding, movements of sediments and large woody debris recruitment.

A wetland may be considered high quality if it meets several of the following criteria:

- Category I or II wetland rating under the Ecology wetland rating system(s);
- Rare or irreplaceable wetland type (e.g. bogs, estuaries);
- Habitat for threatened or endangered species;
- Aquatic habitat or wetland type that is rare or a limited resource in the area;
- Appropriate native habitat located in a floodway, or floodplain which is documented as a frequently-flooded area, or is providing flood retention and storage;
- Provides biological and/or hydrological connectivity
- High regional or watershed importance (e.g. listed as priority site in a basin or watershed plan);
- Large size with high species diversity (plants and/or animals) and/or high abundance of native species;
- A site that is continuous with the head of a watershed, or with a lake or pond in an upper watershed that significantly improves outflow hydrology and water quality.

In general, a high quality wetland: is important to the ecosystem or landscape; supports an appropriate native community; and performs important functions.

Preservation in combination with other forms of compensation

Proposals including preservation will generally also need to replace wetland area through creation or restoration (i.e. creates or restore one acre of wetland for every acre of wetland lost.) When preservation is done with enhancement activities that do not replace lost area, the agencies will typically require more area be preserved (i.e. higher compensation ratios). The agencies evaluate preservation proposals using considerations designed to limit inappropriate uses, and ensure protection of high-quality sites that are under imminent threat of destruction or impairment of ecological functions, wildlife, or fish and aquatic resources.

Preservation is generally acceptable when:

- The impact area is small and impacts are occurring to a low functioning system (Cat III or IV wetland)
- Preservation of a high quality system occurs in the same basin where a resource loss has occurred

- When the functions lost at the impact site occur within the preservation site, or can be exchanged for functions determined to be limiting for local or regional resource needs
- Adequate buffer area protects the preservation site from encroachment or degradation by existing and future land uses

Preservation is generally undesirable when:

- Preservation sites are smaller than 3 acres, including the buffer
- Proposed sites are highly fragmented
- Proposed sites are dominated by non-native plants or animals (or non-native species are expected to spread and threaten the site's natural diversity).-

When can Preservation Alone be used for Compensation?

Preservation by itself is acceptable as compensatory mitigation only in exceptional cases. Preservation alone is generally not acceptable if the impacts are occurring to functions that must be replaced on site, such as flood storage or water quality treatment. These site-specific functions usually need to be replaced by water quality and quantity measures implemented near the project. Preservation without replacement of wetland area generally requires higher ratios than preservation done in addition to replacement of wetland area through restoration or creation.

Preservation alone is most desirable when:

- All requirements for using preservation in combination with creation, restoration or enhancement are met
- The impact site is providing minimal functions, (or is a significantly degraded wetland)
- The impacts are relatively small
- There are no adverse impacts to habitat for listed fish
- There is no net loss of habitat functions within the basin
- The proposed preservation site is high quality and at risk, as defined above
- Higher mitigation ratios are applied

WHAT ARE THE REQUIREMENTS FOR COMPENSATORY MITIGATION?

When regulatory agencies authorize wetland impacts it is usually contingent upon the applicant compensating for lost wetland acreage and functions. Compensation requirements provide the agencies with some reasonable assurance that compensatory wetland adequately offset the wetland impacts.

Requirements for compensatory wetland mitigation tend to be very site-specific and are handled on a case-by-case basis. However, requirements generally involve the same key elements, such as area, functions, replacement ratios, performance standards, monitoring, maintenance, buffers, and permanent protections. This section explains each of these key elements and then proceeds to discuss how the nature and extent of the impacts can influence these requirements.

What does "No net loss" mean?

In 1988 the National Wetlands Policy Forum published its recommendations on how the country's wetland resources should be protected (Conservation Foundation 1988). The principal recommendation was to establish a national wetlands protection goal to achieve no overall net loss of the nation's remaining wetlands base, as defined by acreage and function.

The forum clarified that this goal did not necessarily need to be applied on every permit decision. It means that losses of wetland area and functions overall should be balanced by gains in wetland area and functions. No net loss is a programmatic goal rather than a project-specific goal. The forum also recommended that the ultimate goal should be to increase the nation's wetland resource base, both in terms of quantity and quality. To achieve this, non-regulatory restoration contributes to overall wetland gains, rather than relying solely on the compensation of wetland losses to achieve no-net-loss policy was never formally adopted as federal policy, it remains a national goal established by President George Bush in 1989. Governor Booth Gardner formally adopted this goal for Washington State with Executive Order 89-10 (see p.25 State Policies and Guidance).

Area

Requirements for compensatory mitigation typically focus on providing a specific acreage of wetland necessary to compensate for the wetland area and function that will be degraded or destroyed. Measuring wetland mitigation by acreage has been widely used because it is relatively simple and other practical methods to assess functions have not been widely available.

Area and function are still the primary requirements for compensatory mitigation. The amount of compensation required is determined on a case-by-case basis and is often represented in the form of acreage required (as based on replacement ratios - see p.69 Replacement Ratios). A report by the National Research Council (2001) recommended that wetland functions, as well as area, need to be accounted for. The Corps' regulatory guidance letter, RGL 02-02, also emphasizes the replacement of both area and functions.

Area has been used as surrogate unit of measure to account for authorized impacts and compensation for several reasons:

- It is relatively easy to determine the area of a wetland
- The available methods for assessing functions have limited use in accounting for the amount of loss and the amount of compensation necessary.
- Measuring wetland functions can be time consuming and expensive and it is not always warranted for minor impacts.

Functions and Values

A wetland function is something that a wetland does, regardless of whether anyone notices or appreciates it. Examples include: retaining sediment, transforming nutrients, reducing water velocity, and providing habitat for a variety of wildlife. Not all wetlands perform all functions and wetlands provide functions to varying degrees (Novitzki et al. 1996). For instance, a wetland without organic or clay soils may not retain heavy metals or toxic organic chemicals as well as those that have those types of soils. A closed depressional wetland will perform sediment, nutrient, and toxicant removal to a higher degree than a wetland on a slope. (For descriptions of wetland functions refer to Chapter 2 of *Freshwater Wetlands in Washington State Volume 1: A Synthesis of the Science* (Sheldon et al. 2003)).

A wetland value is something provided by a wetland that benefits, is worthwhile, or desirable to society (Novitzki et al. 1996). Some wetlands are valued for recreational activities, such as hunting, fishing, or bird watching. Wetlands are also valued for their ability to reduce peak flows, thereby preventing downstream flooding.

When an applicant proposes to fill or otherwise alter a wetland, it is important to know what wetland functions will be lost or compromised. This information can be used to help wetland managers understand what societal values may be lost and to make decisions based on the importance of those wetland values. For example, a proposed housing development proposes to fill a wetland that improves water quality, reduces flooding, and provides habitat for invertebrates. The wetland manager reviewing the project finds that the water quality improvement functions are very valuable to society because the wetland discharges into a salmon bearing stream. In this way, understanding what functions are being provides and their relative importance in the landscape allows regulatory staff to make informed decisions about impacts to wetland resources and compensatory mitigation.

Wetland Functions

Biogeochemical Functions Related to Improving Water Quality

- Removing Nutrients
- Removing Sediment
- Removing Metals and Toxic Organic Compounds

Hydrologic Functions Related to Maintaining the Water Regime

- Reducing Peak Flows
- Decreasing Downstream Erosion
- Recharging Groundwater

Functions Related to Maintaining Food Webs and Habitat

- General Habitat
- Habitat for Invertebrates
- Habitat for Amphibians
- Habitat for Anadromous Fish
- Habitat for Resident Fish
- Habitat for Wetland-Associated Birds
- Habitat for Wetland-Associated Mammals

Based on recommendations made by the National Research Council (2001), a Corps' Regulatory Guidance Letter (No.02-2, 12/24/02) promotes the idea that wetland impacts be addressed with "at a minimum, one-to-one functional replacement, i.e., no net loss of functions." In addition, a study of compensation projects in Washington State (Johnson et al. 2002) found that many projects did not adequately compensate for functions lost due to authorized impacts. Therefore, regulatory agencies will increasingly focus on compensating for wetland functions. However, in order to achieve replacement of lost functions, wetland functions must be assessed or measured at both the impact site and the compensatory mitigation site. Trade-offs in functions may be allowed; however, this may influence the replacement ratios required for the project (see p.67 on Replacement Ratios).

What tools are available for Analyzing Wetland Functions?

Since 1989 numerous studies have evaluated whether no-net-loss of acreage is being achieved, but determining whether a net loss of functions is occurring has been more difficult. The National Research Council (2001) concluded that a net loss of functions has been occurring. The authors recommended that in addition to wetland acreage, wetland functions to be lost should also be tracked in a permitting database. Additionally, performance standards, or success criteria, should be written so that replacement of lost wetland functions can be measured and tracked. Wetland "assessment" methods are used to identify, characterize, or measure wetland functions, and in some cases, social values (Bartoldus 1999).

A number of methods have been developed to assess wetland functions in Washington and across the U.S. Some provide semi-quantitative results that indicate the level at which functions are performed. For example, the Washington State Wetland Functions Assessment Method (WAFAM) (Hruby et al. 1999 and 2000) provides a numeric index for each of several functions. This index represents how well the particular wetland performs (has the potential to perform) a function in relation to reference wetlands.

Other methods provide qualitative results, such as the Wetland Functions Characterization Tool for Linear Projects (Null et al. 2000). This method results in a determination of whether a wetland is likely to provide a particular function and why. The results do not indicate how well or to what degree a wetland performs a function.

Some methods were developed to be very rapid, while others may require several site visits to accurately characterize the water regime (e.g., whether a site has permanent standing water). In general, more rapid methods produce more qualitative results.

When assessing wetland functions in Washington, it is best to use a method that has been developed or adapted for the Pacific Northwest. Because of their drastically different climates and geology, different regions of Washington may require the use of different methods. The WAFAM methods include regional methods for the lowlands of western Washington as well as for the Columbia Basin of eastern Washington. These regional methods include specific function assessments for different **hydrogeomorphic** wetland types such as depressional and riverine wetlands.

What follows is a list of methods for analyzing functions that were either specifically developed for Washington wetlands or commonly cited in mitigation plans. A brief description of the method and the pros and cons of each are also provided.

Existing Methods

- *Washington State Wetland Function Assessment Methods (WAFAM)*

  WAFAM is a set of different **assessment** methods. The methods are based on the HGM classification system. Though considered relatively rapid, assessment of a large, structurally complex site may require a couple of days. In addition, site visits at different times of the year may be necessary to accurately determine the water regime (e.g., the length and extent of inundation). Specific training in the application of WAFAM is required before it can be used reliably for regulatory purposes.

  WAFAM includes methods for riverine and depressional wetlands in the lowlands of western Washington and depressional wetlands in the Columbia Basin of eastern Washington.

  WAFAM currently lacks assessment methods for slope and estuarine wetland classes; riverine wetlands in eastern Washington and montane areas; and depressional dunal wetlands.

  Use of WAFAM may be recommended for projects involving significant wetland impacts in terms of size (e.g. >2 acres) or perceived quality (e.g. forested) of the wetland. WAFAM may also be recommended for use on compensatory mitigation sites to determine if lost functions have been replaced or if enhancement actions have resulted in improvements in the level of functions.

- *Washington's Wetland Rating System*[17]

  The rating system is technically a **characterization.** The rating system has been designed to quickly classify wetlands into one of four categories based on functions or other characteristics such as sensitivity and rarity. This allows agencies/local governments to determine how the wetlands should be protected and managed. The rating system is intended to be rapid and relatively easy to perform. Wetlands can be rated in as little as 15 minutes (e.g. small simple sites) or as much as a couple of days (e.g. large sites with dense brush and structural complexity). However, the vast majority of sites can be rated within a half day or less.

  The rating system is not intended to take the place of a more detailed function assessment. However, for small impacts (e.g. <1 acre) to degraded wetlands the rating system may provide sufficient characterization of the wetland's ability to provide general functions[18]. In addition, Ecology and most local jurisdictions will usually require information about a wetland's category.

[17] The Ecology Wetland Rating System for Eastern and Western WA are currently being revised, please make sure you have the most current version.

[18] The rating system was calibrated using the set of reference wetlands used in the development of WAFAM.

- *Wetland Functions Characterization Tool for Linear Projects* (Null 2002)

  This method is also a **characterization**. It uses a list of criteria for each function to guide analysis. Based on whether criteria have been met, a wetland biologist/consultant judges the likelihood that the function is being performed. The method is essentially guided best professional judgment (BPJ), but it provides documentation of the criteria and rationale used to make a decision.

  Washington State Department of Transportation adapted this method for Washington to meet their specific needs for assessing wetland impacts along linear projects. This method can be very rapid. It can also be used to assess a portion of a larger wetland. This can be particularly useful if a wetland crosses multiple properties and the wetland biologist/consultant only has permission to access the portion of the property proposed to be altered.

  This method should not be used to measure change over time or changes resulting from alterations (e.g., impacts or mitigation). The method does not produce a numeric score, and it is not intended to determine the level at which a function may be performed.

- *Semi-Quantitative Assessment Methodology (SAM)* (Cooke 2000)

  SAM provides a rapid method for **rating** functions of wetlands and buffers. SAM is easy to use and requires no specific training (some knowledge of wetland ecology would obviously be beneficial). SAM is also reproducible, such that scores/ratings are not likely to differ for the same wetland from one user to another.

  SAM provides very general information, a consequence of being rapid and easy to use. Simply rating various attributes as high, medium, or low misses a lot of site specific details. Furthermore, assumptions in the methods tend to allocate high ratings to large, rural, undisturbed wetlands, while smaller wetlands in urban areas score lower. In addition, SAM is specific to western Washington wetlands and should not be used for wetlands east of the crest of the Cascade Mountains.

  SAM is generally not recommended for use on large wetland impacts or to determine how much enhancement actions have improved the performance of functions.

- *Wetland Evaluation Technique (WET)* (Adamus et al. 1987)

  WET is a **rating** method that was developed in the late 1980's by the U.S. Army Corps of Engineers in cooperation with Paul Adamus. It provides a rapid rating of wetland functions and values. In addition, WET provides a procedure to assess the suitability of wetland habitat for waterfowl, wetland-dependent birds, fish, and invertebrates (Bartoldus 1999).

WET was designed to be applicable to all wetland types throughout the contiguous U.S. For this reason it is not specific to wetland conditions in Washington and, therefore, provides only general information about functions.

Ecology does not recommend WET for use in Washington State, particularly because other regionally adapted methods to assess the functions of Washington wetlands are available (e.g., Washington's Wetland Rating System, SAM, and Wetland Functions Characterization Tool for Linear Projects).

- *Wetland Values: Concepts and Methods for Wetlands Evaluation (Reppert)*

  Reppert was one of the first methods developed to help determine how wetlands function (NRC 1995). It is a **rating** that groups wetlands into high, medium, and low based on "functional values." However, SAM is the regional adaptation and update of this method and supersedes it. Use of the Reppert method is therefore not recommended for use in Washington State.

- *Hydrogeomorphic Approach (HGM)* (Brinson et al. 1995)

  The **HGM** approach applies to **assessment** methods. It was put forth by the Corps for use in Section 404 permitting. WAFAM is the HGM-based method developed for Washington State. While other HGM-based models have been developed, they are not recommended for use since they have not been adapted for use in this region.

- *Proper Functioning Condition for Lentic and Lotic Areas (PFC)* (Pritchard 1999)

  PFC is a qualitative **characterization** method developed by the Bureau of Land Management (BLM) to assess how well the physical processes in a wetland are functioning. Correct application of this method requires an interdisciplinary team of experts. The lentic method covers wetlands associated with lakes, ponds and depressional wetlands. The lotic method is primarily for riparian wetlands.

  Though not really appropriate as a stand-alone wetland assessment, it can be used in combination with other assessment methods. For wetlands that are "functional-at risk" or "nonfunctional" the methods can help to identify what is lacking (vegetation, soil, water) and may provide guidance on the likelihood of improving the condition and what actions could be taken to improve the condition.

- *Best Professional Judgment (BPJ)*

  Traditionally, wetland biologists have estimated how well a wetland performs functions based on their own experience or knowledge of the wetland science. This approach or use of "best professional judgment" (BPJ) had been used widely because of the lack of easily used function assessment methods. With the range of function assessment and characterization tools currently available, BPJ alone may not be sufficient for agency acceptance of a compensatory mitigation proposal.

Which Function Assessment Method should I use?

Most projects involving impacts to wetlands will, at some level, be required to describe the functions provided by that wetland. Some minimal impacts covered under some nationwide permits may not need to have functions assessed.[19] The level of analysis will depend upon the type and scale of the proposed impacts, such that the detail necessary will be proportionate with the scale of the impacts.

BPJ is recommended for use on relatively small (<1/4 acre) wetland impacts. When used, it is necessary to provide written documentation of the rationale used to decide the level of function provided by the wetland.

If local jurisdictions, Ecology, or both are involved in a project, the applicant will generally be requested to perform Washington's Wetland Rating System to determine the category of the wetland and how well it performs certain functions. Regulatory agencies may request that an applicant complete WAFAM if wetland impacts will be significant and the wetland is in one of the classes for which a WAFAM method exists.

Regulatory agencies will also usually request some assessment of level of function performed by compensatory wetlands. This is particularly true in the case of enhancement. When an applicant proposes to enhance wetlands, a baseline function assessment is required. In order to determine how much of an increase in functions has been attained (i.e., how much replacement of functions has been provided), the level of functions provided the wetlands being enhanced must be assessed prior to any enhancement activities taking place. An assessment of functions may be required as part of the project's performance standards to determine whether a compensation project has provided the required increase in the performance of functions.

[19] Impacts which do not require pre-notification to the Corps are not likely to require assessments of wetland function. Applicants are advised to contact the Corps if you have any questions.

Recommendations for Using Analyses of Functions

- Most projects involving impacts to wetlands will, at some level, be required to describe the functions provided by that wetland.
- The level of analysis will depend upon the type and scale of the proposed impacts. The detail necessary will be commensurate with the impacts. Regulatory agencies may request that an applicant complete WAFAM if wetland impacts will be significant and the wetland is in one of the classes for which a WAFAM method exists.
- If Ecology is involved in a project the applicant will generally be requested to perform Washington's Wetland Rating System to determine the category of the wetland and how well it performs certain functions.
- An analysis of functions should be provided at the site used for compensation prior to implementing any enhancement.
- Function assessments should be used to help determine whether a project has provided the required increase in or level of functions for larger impacts.

What is a Mitigation Plan?

When impacts to wetlands are authorized, applicants usually need to develop a compensatory mitigation plan outlining how they are compensating for authorized impacts to wetlands. Part 2 of this guidance provides detailed information on what needs to be in a mitigation plan and how to develop the plan.

Basically, the mitigation plan explains what resources and functions were lost, what the goals and objectives are for the compensation, why the compensation site was selected, how it will be developed, and what the standards are for judging the success of the mitigation. See Part 2 for more information and a recommended outline for a mitigation plan.

Goals, Objectives, and Performance Standards

A critical element for determining the success and compliance of a mitigation project is to formally identify the purpose of the project (goals), the steps required to accomplish that purpose (objectives), and measurable indicators to determine that the purpose has been accomplished (performance standards).

Every compensation project is unique and has its own site-specific considerations. However, its goals, objectives, and performance standards still need to target basic wetland parameters. In particular, goals should identify the proposed wetland area,

water regime (or **hydroperiod**), and vegetation community type (e.g., Cowardin class). Objectives should describe the types of compensation that will be used and the specific actions that will result in the proposed wetland area, water regime, and community types. Performance standards, then, should outline measurable indicators for these wetland parameters, such as wetland delineation of a specific acreage, inundation of a specific depth and/or for a specific duration, specific percent areal cover of species comprising the targeted vegetation community, specific level of diversity within the targeted community type, and maximum percent areal coverage of invasive vegetation species that will be allowed.

For example, the goal of a project could simply be *"establish a X-acre wetland and replace the wetland functions lost."* Possible objectives may include "*restoring X-acres of wetland by plugging ditches and breaking drain tiles*," and "*provide a moderate level of water quality functions, a moderate level of water quantity functions, and a moderate level of wildlife habitat functions*." A variety of performance standards could provide measurable indicators that the objectives and goal have been achieved, such as "*the area of wetland will be X acres, as determined by a wetland delineation*," "*application of an approved function assessment method on the restored wetland will result in a scores equivalent to a moderate level of water quality, water quantity, and wildlife habitat functions*."

Part 2 of this document provides more specific information on goals, objectives, and performance standards.

Monitoring Compensatory Mitigation

Monitoring involves gathering data about conditions at a compensation site. Monitoring data are used to determine whether a project is achieving its performance standards, and therefore its goals and objectives, within a predicted timeframe. Monitoring also provides critical information about whether a site needs maintenance or contingency actions. Monitoring is essential to ensure that a project to achieve its stated purpose and comply with permit obligations.

Monitoring requirements are typically identified in the wetland mitigation plan. The duration, frequency, and methods of monitoring depend on the goals, objectives, and performance standards for the project. In general, compensation projects will be monitored for at least five years. If a scrub-shrub or forested vegetation community is proposed, monitoring requirements of at least 10 years may be prescribed since a minimum of 8 years is required to achieve 80 percent canopy closure (Celedonia 2002). Monitoring may be extended if interim performance standards are not being met.

Maintenance

Compensatory wetland mitigation sites require maintenance to help ensure that performance standards and goals will be achieved. Maintenance includes implementing corrective actions to rectify problems, such as an insufficient water supply or inappropriate water regime, **invasive species** infestation (e.g., reed canarygrass, bull frogs, tent caterpillars), trash, vandalism, or anything else that may result in a project not meeting its stated goals, objectives, and performance standard. Johnson et al. (2002) observed that a lack of maintenance was one of the main reasons for poor success of mitigation projects.

A contingency plan outlines actions that would be triggered if project monitoring revealed a problem that would prevent the site from attaining its stated goals, objectives, and performance standards. Contingency plans should identify potential problems and the specific maintenance activity that would be implemented to fix each problem. A contingency plan may be required as part of the mitigation plan.

Adaptive management is another aspect of project maintenance. Adaptive management may be implemented when unforeseen circumstances result in problems with a compensation project, such as, a hundred-year flood wiping out planted vegetation or depositing excessive amounts of sediment or gravels in the compensation area. Another example may be a site that has implemented its contingency plan to rectify problems, but the same problems remain. Adaptive management involves the applicant and the regulatory agencies discussing the problems and possible solutions or alternative approaches. It may entail acknowledging that a particular site-design is not compatible with conditions at the compensation site. In extreme cases adaptive management may result in a change in project goals, objectives, or performance standards due to unanticipated site conditions. In other cases, additional mitigation activities at another site may be required.

Compliance and Enforcement

Recognizing that compensatory mitigation replaces the aquatic functions that are destroyed or degraded as a result of an authorized activity and, in keeping with a goal of no net loss of wetlands, regulatory agencies must ensure, to the best of their abilities, that compensatory mitigation is not only appropriate and practicable, but also successful. To accomplish this, regulatory programs typically include compliance and enforcement elements.

Compliance deals with ensuring that permitees comply with the terms and conditions of their authorizations. Under their compliance responsibilities, regulatory agencies typically inspect mitigation sites, review project status and monitoring reports, and determine whether mitigation projects have met their performance standards. Permitees should expect that the Corps, Ecology, and other regulatory agencies will take an active role in ensuring the compliance of their projects. Recent research by Ecology concluded

that compensatory mitigation projects that are subject to active compliance by regulatory agencies tend to be more successful. A permittee who fails to comply with the terms and conditions of a permit may be subject to judicial action or a civil penalty. For example, the Clean Water Act authorizes a civil penalty for non-compliance that can result in a fine of up to a $27,000 per violation.

In contrast to compliance, enforcement deals with activities that have occurred without proper authorization. In addition to protecting the environment, enforcement actions help preserve the integrity of a regulatory program by ensuring that everyone is treated fairly and consistently. An effective enforcement program also helps eliminate unfair advantages (e.g., economic, temporal) that might accrue to someone who does not abide by our environmental laws and regulations. Enforcement procedures normally involve working cooperatively with a violator to resolve the violation, including remediation of the adverse environmental impact of the unauthorized action. However, when necessary, enforcement actions include civil or criminal procedures that can result in substantial fines and/or imprisonment.

Financial Assurances

Some projects may be required to post a financial assurance to ensure that the compensation site is constructed and performs as required. Some financial assurances are held until the regulatory agency determines that the site is fully compliant. Others may be released after construction of the site. Several different forms of financial assurances are available such as performance bonds, letters of credit. Local governments often require performance bonds, accordingly, applicants also should check with their local planning department on whether performance bonds or other forms of financial assurances will be required.

Funding for Management

On larger compensation sites and sites that are given to another entity for the long-term maintenance, applicants are usually required to provide a source of funding for the long-term management of the compensation site. This may include the establishment of an endowment which generates sufficient interest to fund ongoing management activities (weed control, repair of vandalism, monitoring, etc.).

Long-term Protection

In order to ensure the successful replacement of lost wetland area and function, applicants usually must provide a means of protecting the compensatory site for the long term. Compensatory wetlands can be protected from future loss and degradation through the use of buffers and long-term protection mechanisms.

Buffers are a common element of compensation requirements. Buffers are vegetated areas adjacent to wetlands, or other aquatic resources, that can reduce impacts from adjacent land uses through various physical, chemical, and/or biological processes. The key purpose of buffers is to protect and maintain the wide variety of functions and values provided by the wetland.

Regulatory agencies require that compensation wetlands include a buffer based on the minimum width necessary to protect the most sensitive functions performed by the wetland. For example, if your compensatory mitigation rehabilitates a Category II wetland (a wetland that performs a range of wetland functions at a relatively high level) the buffer width necessary will be determined based on a Category II wetland. A mitigation site located next to moderate intensity land uses is likely to need a 150-foot buffer. (See p.79 Buffers, for detailed guidance on buffer requirements and determining appropriate buffer width.)

Just as buffers help to protect functions provided by a compensation site, the compensation site itself needs to be protected from future loss or degradation. This is particularly true when preservation of existing wetlands is provided to compensate for wetland losses. **Deed restrictions** and **conservation easements** are the most common legal mechanisms used to prevent the development of mitigation areas.

Deed restrictions place an encumbrance on the property to prevent future incompatible land uses on the site. Unfortunately, deed restrictions can be removed from property titles and must be enforced through the courts. Conservation easements are preferred for protecting compensatory mitigation sites. Conservation easements usually involve a third party who agrees to accept responsibility for ensuring that the terms of the conservation easement are met. Agencies and conservation entities may hold conservation easements and may require an endowment from the applicant to cover future legal costs.

Compensation sites and their buffers may also need physical protection from recreational vehicles, lawnmowers, cats and dogs, herbivores (geese, deer etc.), or pedestrian traffic. A variety of technique can be used to physically protect a site. The protection needed depends on the type of threat to the site and the functions provided by the site. Fences can offer protection against various forms of intrusion depending upon the type of fence. For example, people can often be deterred by a split rail fence or even signs indicating that the area is for mitigation and should not be disturbed (*See Note on fencing below*). Planting native thorny shrub species in the buffer also effectively deters people from entering the mitigation site. Placing large boulders in areas where vehicles can access the site can effectively deter off road vehicle use of the site. Protection against browsing animals may need to be targeted at specific species, since an 11-ft fence may prevent deer from entering a site, but it probably won't stop geese from getting in and grazing down all the edible emergent vegetation. Preventing mice from girdling the cambium of trees and shrubs may require use of protective tubes.

Note on fencing:

Most mitigation sites include wildlife habitat as a goal or objective. If a fence is necessary, it is important to use fencing that is appropriate for wildlife use of the site. Wildlife should be able to get into and out of the mitigation site through the fence. Examples include split rail and smooth wire fencing. Applicants should also consider, in-lieu of fencing, a natural barrier that would discourage public encroachment into a mitigation site by planting a thick buffer dominated by spiny/thorny plants such as rose, salmonberry, and/or Hawthorne. This could be complemented with signage. Chain link fencing around mitigation sites is discouraged unless necessary for other reasons.

Public Notice and Comment

As shown in the "Basic Mitigation Review Process" flowchart, after an application for a permit has been submitted and reviewed as complete, there is usually an opportunity for public input. In most cases, the public has the opportunity to provide comments on the proposal and its accompanying mitigation plan. Through the U.S. Army Corps of Engineers' (Corps) 404 permit process, the general public has an opportunity to comment on compensatory mitigation plans during the Corps public notice comment period. When a state 401 certification is necessary, Ecology will usually issue a joint public notice with the Corps to obtain public comment on the proposed project.

A public notice is prepared and circulated by the Corps for those applications that require a Standard Individual Permit. Usually, the public notice contains an abbreviated written synopsis and drawings of the compensatory mitigation proposed by the applicant. The full preliminary compensatory mitigation plan is made available upon request. However, this process only affords the public a limited opportunity to provide comments on compensatory mitigation plans since most permit actions are conducted under the Corps Nationwide Permit Program where there is no formal opportunity for the public to comment on and review mitigation plans.

On the local level, the public may have an opportunity to comment on proposals through the SEPA Process. Contact your local community development office for information about opportunities for specific information on public review and comment opportunities provided that jurisdiction.

HOW DO THE AGENCIES DETERMINE WHAT IS APPROPRIATE COMPENSATION?

To determine what you'll need to provide as compensation, several key decisions must be made. This section describes considerations for making those decisions. The section includes information on: how much area you are likely to need to provide, what type of wetland is appropriate, where the site should be located, what functions should be provided, and how wide of a buffer is necessary for the site.

What are Replacement Ratios?

The goal of compensatory mitigation is generally to replace both the number of wetland acres that would be lost as a result of an activity and the wetland functions that would be impaired or destroyed as a result of that activity. To accomplish this goal, regulators must consider such factors as the risk of failure of a compensatory mitigation project, the temporal loss that may accrue as the mitigation wetland develops, the nature and effectiveness of the mitigation itself, and trade-offs associated with out-of-kind and off-site mitigation. These considerations usually result in compensatory mitigation that involves more acres than would actually be impacted. When the acres of compensatory mitigation are compared to the acres of impact, the result is a ratio known variously as a "replacement," "compensation," or "mitigation" ratio. Using science, policy, and experience, regulatory agencies may develop a set of ratios that inform project proponents of the approximate amount of compensatory mitigation that is likely to be required for a particular impact under normal circumstances.

The following sections provide:

- a rationale for using ratios
- a set of mitigation ratios applicable to Washington State, and
- guidelines for using these ratios.

A replacement ratio, or compensation ratio, is one approach used to determine appropriate replacement of permitted wetland losses. The replacement ratio reflects the acreage of a particular type of compensatory mitigation (creation, restoration, enhancement, or preservation) needed to make up for the loss of an acre of wetland (King et al. 1993). For example, a permitted loss of a one-acre wetland may require six acres of enhancement in order to adequately compensate for the loss of functions, thus requiring a 6:1 replacement ratio.

Note: ***The replacement ratios provided in this section are guidance.***

They represent what a permit applicant can expect as requirements for compensation, thereby providing some predictability for applicants. However, ***regulatory agencies must make an individual determination on the replacement ratios required for specific wetland impacts to ensure that the compensation is proportionate to the proposed loss of wetland acreage and functions.*** In other words, the required compensation represents a roughly proportional exchange for the proposed impacts (*Dolan v. City of Tigard*, 512 U.S. 374, 114 S.Ct. 2309, 129 L.Ed.2d 304 (1994)) to provide and ensure the adequate compensation of wetland area and functions.

Rationale for the Use of Replacement Ratios

When compensatory wetland mitigation was first required, the loss of an acre of wetland would simply require an acre of compensation. However, a 1:1 replacement ratio is generally no longer considered appropriate (Castelle et al. 1992, King et al. 1993, National Research Council 2001) for the following reasons:

- *Risk of failure*. It is possible that compensation projects will not perform as proposed (King and Bohlen 1994) and therefore may fail to compensate for wetland losses (Castelle et al. 1992).
- *Temporal loss*. It may take anywhere from several years to several decades for a compensation project to achieve ecological equivalency (National Research Council 2001) and to develop the proposed/required wetland structures and/or functions (Castelle et al. 1992).

The goal is to replace lost wetland functions at a 1:1 ratio; yet due to the risk of failure and temporal loss it is usually necessary to require a greater acreage as replacement in order to ensure that functions are replaced. Though higher replacement ratios result in more area for compensatory mitigation, size does not guarantee success or quality.

Four additional factors will affect the replacement ratios required.

- *Type of compensation*. Some types of compensation result in a net loss of wetland acreage and/or function (e.g., enhancement, preservation) and therefore a larger acreage of compensation is required to make up for wetland losses. For example, the use of enhancement results in a net loss of wetland area and may result in a very limited increase in wetland functions, or a trade-off in functions (Johnson et al. 2002). Thus, enhancement typically requires higher replacement ratios than restoration or creation. Conversely, replacement of a low quality wetland with a higher quality wetland can reduce the ratio.
- *Type and quality of the wetland impacts or alterations*. There are many types of wetlands and various degrees of degradation. As a result, not all wetlands

provide the same levels of functions or values. Replacement ratios, therefore, must take into account the type and quality of the wetland and the functions and values that would be lost. For example, the loss of a high-quality forested wetland would require a higher replacement ratio than the loss of a highly degraded wet pasture (Breaux and Serefiddin 1999). This is because of the much higher risk of not adequately replacing the forested wetland, and the greater time needed to establish a forested wetland as compensation.

- *Location of compensation*. Ratio guidance relates to in-kind mitigation in close proximity to the impact area. Additional wetland area may be required to offset losses if out-of-kind replacement is proposed or the replacement wetland is located quite a distance from the impact area.
- *Permanence or degree of impact or alteration*. In some cases a wetland may only be temporarily disturbed. For example, when a new pipeline crosses through a wetland the vegetation, soil, and hydroperiod are altered, but after construction, measures will be taken to re-vegetate, replace the soil, and ensure the hydroperiod has not changed. In other cases the alteration may be a conversion from one wetland type to another, such as converting a forested or scrub-shrub wetland to an emergent wetland for overhead utility lines or buried pipelines, or conversion of an emergent or shrub wetland to open water for recreational uses. Temporary impacts and conversions generally require lower ratios than permanent wetland losses.

What Ratios are Recommended for Compensatory Mitigation?

The following recommendations on replacement ratios for compensatory mitigation are based on replacing a wetland with a similar type and category of wetland (Category as determined by the Washington Wetland Rating System). On a case-by-case basis, it is possible to make use of function assessment scores (such as from the *Washington Wetland Rating System* or *WFAM* – if the impact site and the site used for compensation are of the same **HGM** class and subclass) to compare the functions of the mitigation site with those of the impact site. This information may be used to adjust replacement ratios.

Furthermore, all ratios are based on the assumption that the proposed compensatory mitigation does not create, restore, or enhance an "atypical" wetland. This means that the project proposed does not alter the **hydrogeomorphic** setting of the site appropriate for its position in the landscape. For example, excavating depressions to "enhance" a slope wetland is "atypical" because depressional wetlands do not occur on a slope. Also, these ratios are for a concurrent compensatory mitigation project. If the impacts to a wetland are to be mitigated by using an established "mitigation bank," the rules and ratios applicable to the bank should be used.

The ratios are separated based on the type of compensatory mitigation proposed (restoration, creation, and enhancement). The definitions for wetland project types are provided on p. 41.

Basic Assumptions for Using the Guidance on Ratios

- All ratios are based on the assumption that the proposed compensatory mitigation does not create, restore, or enhance an "atypical" wetland. This means that the project proposed does not alter the hydrogeomorphic setting of the site, and the type of wetland proposed is appropriate for its position in the landscape. For example, excavating depressions to "enhance" a slope wetland is "atypical" because depressional wetlands do not occur on a slope.
- The ratios are for a concurrent compensatory mitigation project. If the impacts to a wetland are to be mitigated by using an established "mitigation bank," the rules and ratios applicable to the bank should be used.
- The recommended ratios for compensatory mitigation are based on replacing a Category I or II wetland with a Category II wetland, and replacing a Category III or IV wetland with a Category III wetland.
- The ratio for using enhancement alone, without any replacement of wetland area, is 4 times that for restoration or creation.
- If the wetland area impacted is replaced at a 1:1 ratio (restoration or creation), the remainder of the area needed for restoration or creation can be replaced by enhancement. See tables below for ratios. (For more information see the text on p. 76 Using Enhancement with Re-establishment or Creation)
- **These ratios were developed to provide a starting point for further discussions with each proponent of compensatory mitigation. They are based on averaging the observations of mitigation success and risk at a programmatic level, and do not represent the specific risk of any individual project.**

Mitigation Ratios for projects that do not alter the hydrogeomorphic setting of the site used for mitigation.

The following ratios were developed to provide a starting point for further discussions with each proponent of compensatory mitigation. They are based on evaluations of mitigation success and risk at a programmatic level, and do not represent the specific risk of any individual project. Eastern and western Washington contain different landscape settings, surficial geology, climate, and wetland types and functions. The ratio guidance provides a table each for Eastern Washington and Western Washington.

NOTE: Preservation is discussed separately at the end of this section**.**

Table 6: Ratios for Projects in Eastern Washington that do not alter the Type or HGM setting of a Compensation Site.

CATEGORY and TYPE of WETLAND	Re-establishment or Creation	Rehabilitation**	1:1 Re-establishment or Creation (R/C) and Enhancement (E)	Enhancement Only
All Category IV	1.5:1	3:1	1:1 R/C and 2:1 E	6:1
All Category III	2:1	4:1	1:1 R/C and 2:1 E	8:1
Category II forested	4:1	8:1	1:1 R/C and 6:1 E	16:1
Cat II vernal pool	2:1 Replacement has to be seasonally ponded wetland	4:1 Replacement has to be seasonally ponded wetland	Case by Case	8:1
All other Category II	3:1	6:1	1:1 R/C and 4:1 E	12:1
Category I Forested	6:1	8:1	1:1 R/C and 10:1	24:1
Category I based on score for functions	4:1	8:1	1:1 R/C and 6:1 E	16:1
Category I Natural Heritage site	Not considered possible*	6:1 rehabilitation of a Natural Heritage site	Case by Case	Case by Case
Category I Alkali	Not considered possible*	6:1 rehabilitation of an alkali wetland	Case by Case	Case by Case
Category I Bog	Not considered possible*	6:1 rehabilitation of a bog	Case by Case	Case by Case

*****Natural Heritage sites, Alkali wetlands, coastal lagoons and bogs are considered irreplaceable wetlands, and therefore no amount of compensation would replace these ecosystems. Avoidance is the best option. In the rare cases when impacts cannot be avoided, replacement ratios will be assigned on a case-by-case basis. However, these ratios will be significantly higher than the other ratios for Category I wetlands. *Criteria for determining appropriate ratios in these circumstances will be forthcoming.*

**Rehabilitation ratios are based on the assumption that actions judged to be most effective are being implemented (see Tables 4 and 5 on pp. 48-49). Also, refer to page 47 – What is the distinction between rehabilitation and enhancement?

Table 7: Ratios for Projects in Western Washington that do not alter the Type or HGM setting of a Compensation Site.

CATEGORY and TYPE of WETLAND	Re-establishment or Creation	Rehabilitation***	1:1 Re-establishment or Creation (R/C) and Enhancement (E)*	Enhancement Only
All Category IV	1:5:1	3:1	1:1 R/C and 2:1 E	6:1
All Category III	2:1	4:1	1:1 R/C and 2:1 E	8:1
Category II estuarine	Case-by-case	4:1 rehabilitation of an estuarine wetland	Case-by-case	Case-by-case
Category II interdunal	2:1 Compensation has to be interdunal wetland	4:1 Compensation has to be interdunal wetland	1:1 R/C and 2:1 E	8:1
All other Category II	3:1	8:1	1:1 R/C and 4:1 E	12:1
Category I Forested	6:1	12:1	1:1 R/C and 10:1	24:1
Category I based on score for functions	4:1	8:1	1:1 R/C and 6:1 E	16:1
Category I Natural Heritage site	Not considered possible**	6:1 rehabilitation of a Natural Heritage site	Case by Case	Case by Case
Category I Coastal Lagoon	Not considered possible**	6:1 rehabilitation of a coastal lagoon	Case by Case	Case by Case
Category I Bog	Not considered possible**	6:1 rehabilitation of a bog	Case by Case	Case by Case
Category I Estuarine	Case-by-case	6:1 rehabilitation of an estuarine wetland	Case by Case	Case by Case

* Both ratios apply to area of impact. See explanation on p.76 Using enhancement with re-establishment or creation.

**Natural Heritage sites, Alkali wetlands, coastal lagoons and bogs are considered irreplaceable wetlands, and therefore no amount of compensation would replace these ecosystems. Avoidance is the best option. In the rare cases when impacts cannot be avoided, replacement ratios will be assigned on a case-by-case basis. However, these ratios will be significantly higher than the other ratios for Category I wetlands.

***Rehabilitation ratios are based on the assumption that actions judged to be most effective are being implemented (see Tables 4 and 5 on pp. 48-49). Also, refer to page 47 – What is the distinction between rehabilitation and enhancement?

What Criteria influence when a replacement ratio may be increased or decreased?

The preceding tables provided general guidance on what replacement ratio your project may be required to provide. As noted earlier, the ratios recommended are based on programmatic evaluations of mitigation and don't reflect individual site conditions. As a result, the ratios identified may result in requirements for too little or too much compensation based on the specific conditions of a site. This section identifies the factors that the agencies use when determining whether a project may need an increase in ratios (*provide more mitigation*) or a decrease in ratios (*provide less mitigation.*)

Replacement ratios may be increased under the following circumstances:

1. Uncertainty exists as to the probable success of the proposed restoration or creation; or
2. A significant period of time will elapse between impact and establishment of wetland functions at the mitigation site; or
3. Proposed compensation will result in a lower category wetland or reduced functions relative to the wetland being impacted; or
4. The impact was an unauthorized impact.

Replacement ratios may be decreased under the following circumstances:

1. Documentation by the applicant provides more certainty that the proposed compensation actions will be successful. For example, demonstrated prior success with similar compensation actions as those proposed, and/or extensive hydrologic data to support the proposed water regime.
2. Documentation by the applicant demonstrates that the proposed compensation actions will provide functions and values that are significantly greater than the wetland being impacted.
3. The proposed mitigation actions are conducted in advance of the impact and are shown to be successful.

Impacts to Existing Compensatory Wetland Sites should be avoided. However, if unavoidable impacts are likely to occur, the agencies consider the following when determining replacement ratios:

- If the project has been completed (i.e., permit requirements are fulfilled and the site has been closed out by the regulating agency) then the compensation wetland will be viewed as any other natural wetland. Replacement ratios will be based on its existing wetland area, level of impact, functions, type, and category.
- If the project is still active (i.e., still under construction or being monitored), then the replacement ratios could be higher to address the additional temporal loss of the original wetland's functions and area. However, specific replacement ratios will depend upon how the site is currently functioning, the level of impact, and how close the site is to meeting its projects goals.

Using Enhancement with Re-establishment or Creation

Most compensation projects should include replacement of wetland area. When a mitigation proposal includes re-establishment or creation along with enhancement, two ratios are used to determine the total amount of compensation required. The third column in both tables 3 and 4 lists the ratios required for impacts to different wetland categories and types. When using these ratios, both the re-establishment /creation and the enhancement ratios listed are per acre of impact. In other words, when the column lists the ratios as "1:1 R/C and 6:1 E" it means that for every acre of impact an applicant would be required to provide 1 acre of re-establishment or creation and 6 acres of enhancement. Thus, for a 3-acre impact to a category II forested wetland in eastern Washington, the amount of mitigation necessary would be 3 acres of creation/re-establishment plus 18 acres of enhanced wetland for a total area of 21 acres. Alternatively, in this scenario, the applicant could have provided 12 acres of re-establishment or creation (4:1 from table 3) to offset the three-acre loss.

When rehabilitation is used with creation or re-establishment, the ratio for rehabilitated area will be determined based on the level of improvement of functions or degree of restoration of ecological processes. In most cases, the ratios for rehabilitation will be less than those for enhancement.

Replacement Ratios for Preservation

In some cases, preservation of existing wetlands may be acceptable as compensation for wetland losses. Ideal preservation sites those which are: important due to their landscape position, rare or limited wetland types, and those that provide high levels of functions. See p. 52 for more information on Preservation.

> ***Mitigation ratios for preservation in combination with other forms of mitigation*** generally range from 10-to-1 to 20-to-1, as determined on a case-by-case basis, depending on the quality of the wetlands being mitigated and the quality of the wetlands being preserved.
>
> ***Mitigation ratios for preservation as the sole means of mitigation*** generally start at 20-to-1. Specific ratios will depend upon the significance of the preservation project and the quality of the wetland resources lost.

Replacement Ratios for Temporal Impacts and Conversions

When temporal impacts (see p. 39, Types of Impacts) to wetlands occur and the wetlands are not permanently lost, for instance clearing of wetland vegetation during pipeline construction, the agencies often require some mitigation for the temporal loss of wetland functions. Although the wetlands will be re-vegetated, and over time are anticipated to have their previous level of functioning restored, a long-term loss of functions will occur. In addition, there is some risk of failure associated with the impact or alteration, especially when deep excavation is required to accommodate drilling equipment.

Generally, the ratios for temporal impacts are half of the recommended ratios for permanent impacts, provided that the following measures are applied:

- An explanation of how hydric soil, especially deep organic soil, is handled in the areas where the soil profile will be severely disturbed for a fairly significant depth and/or time.
- Groundwater flow patterns and how draining the wetlands will be avoided must be identified and described.
- A 10-year monitoring and maintenance plan for restored forest and shrub wetlands.
- Disturbed buffers are re-vegetated and monitored.
- The hydroseed mix to be applied on disturbed restored areas must be identified.*

* However, if the impacts are to non-native emergent wetlands (e.g. reed canarygrass wetlands), restoration of the site after construction is generally all that is required.

Loss of functions due to the ***conversion of wetlands*** from one type to another also requires replacement. When wetlands are not completely lost, but are converted to another type, such as a forested wetland converted to an emergent or shrub wetland, some functions are lost or reduced. Replacement ratios will vary based on the degree of the alteration, but they are generally less than those required for permanent losses.

Can I receive Compensation Credit for Buffers and Uplands on my mitigation site?

Buffer and upland acreage above and beyond the minimum buffers required to adequately protect the compensatory wetland may be used as part of a mitigation package. As with the wetland area, the buffer areas must be protected from future uses that are incompatible with the mitigation goals. Credit for buffers and other upland areas will only be granted after a minimum of 1:1 replacement of wetland area. The amount of credit generated by buffers and uplands will generally range from 5:1 to 20:1 and will be determined based on the following criteria:

- Degree to which the buffer provides connectivity to other habitat areas;
  - Provides corridors or linkages to other habitat areas;
  - Expands or adds onto an existing habitat or protected area;
- Quality of the additional buffer (beyond the required area) or upland area;
- Ability to increase the performance of wetland functions;
- Ability to provide additional ecological functions.

The agencies base the minimum buffer width required on the type of wetland proposed (Category II or III) and the functions provided by the wetland. The buffer needs to provide adequate protection for the most sensitive functions. Refer to p. 80 for information on buffer requirements.

Summary on Ratios

Regulatory agencies will determine the amount of compensation necessary to mitigate wetland impacts on a case-by-case basis to ensure that the loss of wetland acreage and functions is adequately addressed. The replacement ratios provided in Tables 6 and 7 are intended to offer applicants some predictability and assist with developing mitigation proposals. In general, agencies look more favorably on proposals that: will replace wetland impacts with the same or higher category of wetland; are located in areas where the mitigation can contribute to ecosystem functioning at a large scale (e.g. part of river corridors and green space networks); and will clearly identify how the compensation actions will replace the functions lost or provide measurable gains in other functions important in the area. (Refer to p.48, Tables 4 & 5 for more information on compensation actions).

Buffers

All compensation wetlands need a buffer. Buffers are vegetated areas adjacent to wetlands, or other aquatic resources, that can reduce impacts from adjacent land uses through various physical, chemical, and/or biological processes.

The primary purpose of buffers is to protect and maintain the wide variety of functions and values provided by wetlands (or other aquatic areas). The physical characteristics of buffers—slope, soils, vegetation, and width—determine how well buffers reduce the adverse impacts of development and provide the habitat needed by wildlife species that use wetlands. For wildlife that use wetlands but also require uplands to meet their life-history needs, buffers provide necessary terrestrial habitats. Buffers and other adjacent upland areas can provide habitat for other wildlife species that do not commonly use wetlands.

Protecting wildlife habitat functions of wetlands generally requires larger buffers than protecting water quality functions of wetlands. However, the width necessary to protect a compensation site from adjacent impacts is contingent upon a number of criteria, such as:

- The functions of the compensatory mitigation to be protected by the buffer
- The characteristics of the compensatory wetlands
- The characteristics of the watershed contributing to the compensatory project
- The characteristics of the buffer itself
- The intensity of the adjacent land use (or proposed land use)
- The specific functions that the buffer is supposed to provide including wildlife habitat for targeted species [20]

Note: Hydrologic functions, however, cannot be adequately protected with buffers since they are driven by environmental processes operating outside of the site.

Buffers of one fixed-width may not adequately address the issues of habitat fragmentation and population dynamics. Rather, it is recommended to have a more flexible approach that allows buffer widths to be varied depending on site-specific conditions. Refer to p.87 for information on when buffer averaging is acceptable.

Regulatory agencies will require that compensatory wetlands have a buffer based on the minimum width necessary to protect the most sensitive functions. The acreage provided by the required buffer generally will not contribute toward acreage requirements for compensation, since the functions of the wetland could be compromised without this buffer. Buffer acreage beyond the required minimum, however, can be applied toward the acreage requirements for compensation provided that certain conditions are met (see p.78, Compensation Credit for Buffers and Uplands). For example, a category III

[20] The above section was adapted from *Freshwater Wetlands in Washington State Volume 1: A Synthesis of the Science* (Sheldon et al. 2003). The text has been modified slightly to apply to compensatory mitigation.

compensatory wetland surrounded by low and moderate intensity land-uses needs a 110-foot buffer to protect its functions. If the compensation proposal includes a 200-foot buffer for the wetland, the additional 90 feet may be used to meet requirements for compensation area if the buffer area provides additional habitat, connectivity and supports appropriate native plant communities. If the buffer contains non-native plant communities applicants may need to enhance the buffer to use it for compensation credit.

When buffer areas are adjacent to land uses that might encroach upon the buffer (e.g. lawns, parks, etc.) the buffer boundary should be identified with a semi-permanent marker. Signs, Large rocks, wildlife friendly fencing[21] or other boundary markings can help reduce intrusions into the buffer. Many compensatory sites that are adjacent to or within subdivisions and other land uses have experienced reductions in the width of their buffer over time. The reductions can result from several causes, from the removal of native vegetation to increase lawn space to use of the buffer as a dumping ground for lawn and yard waste, use as pet areas and waste disposal sites. These activities can degrade the buffer over time. Use of boundary markers, large rocks, or wildlife friendly fencing should reduce the level and permanence of intrusions into the buffer. See p. 66 Long-term protection for more information.

How wide of a Buffer will I need to protect my Compensatory Wetland?

The buffers recommended in the following tables were developed based on the review of scientific information done for *Freshwater Wetlands in Washington State Volume 1: A Synthesis of the Science* (Sheldon et al. 2003). It represents a synthesis of the information about the types and size of buffers needed to protect functions and the special characteristics in wetlands.

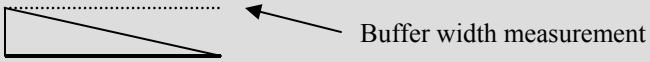
The concept that not all types of proposed land-uses have the same level of impact has been incorporated into the buffer recommendations in Table 9. For example, a new residence that is being built on five acres of land next to a wetland is expected to have a smaller impact than if 20 houses were being built on the same 5 acres. Three categories of impacts are outlined – changes to land-uses that create high impacts, moderate impacts, and low impacts. Categories for impacts and definitions of land-uses are provided in Table 8 below.

[21] Chain link fences are not recommended due to their disruptions to wildlife movement.

Basic Assumptions for Using the Guidance on Buffer Widths

Recommendations for widths of buffers assume that:

1. The wetland has been categorized using the *Washington Wetland Rating System*.
2. The buffer is vegetated with native plant communities that are appropriate for the ecoregions.
3. If the vegetation in the buffer is disturbed (e.g. grazed, mowed, etc.) or non-native, proponents planning changes to land use that increase impacts to wetlands will have to rehabilitate the buffer with native plant communities that are appropriate for the area.
4. The width of the buffer is measured in horizontal distance (i.e., along the horizontal plane.



This is because the effectiveness of buffers at removing pollutants before they enter a wetland decreases as the slope increases.

Table 8: Definitions for the "intensity" of impacts on wetlands from adjacent land uses

Categories of Impact by Land Use	Definition based on common zoning categories
High	Commercial, Urban, Industrial, Institutional, Retail Sales, Residential with more than 1 unit/acre, Agriculture (high-intensity processing such as dairies, nurseries and green houses, raising and harvesting crops requiring annual tilling, raising and maintaining animals), High intensity recreation (golf courses, ball fields), hobby farms
Moderate	Residential with 1unit/acre or less, Moderate -Intensity Open Space (parks), Agriculture (moderate- intensity such as orchards and hay fields)
Low	Forestry, Open space (low-intensity such as passive recreation and natural resources preservation)

Table 9: Width of buffers needed to protect wetlands in each rating category if impacts of land uses are categorized. Note: When buffer widths are different from eastern to western Washington, both widths are shown.

Category of Wetland	Low Impact Land-Use	Moderate Impact Land-use	High Impact Land-use
IV	25 ft	40 ft	50 ft
III	75 ft	110 ft	150 ft
II	100 ft	150 ft	E. Wa. - 200 ft W. Wa. - 300 ft
I	E. Wa. - 125 ft W. Wa. - 150 ft	E. Wa. - 190 ft W. Wa. - 225 ft	E. Wa. - 250 ft W. Wa. - 300 ft

When can a Recommended Buffer Width Be Reduced?

In some cases, the agencies may allow buffer widths that are smaller than the recommended width. A buffer reduction may be acceptable when it won't result in increased disturbance to the wetland. The agencies have identified conditions where the buffer may be reduced: when the impacts from adjacent land uses are reduced; when there is already an existing road or structure within the buffer; and when there is a natural barrier to providing full buffer. See below for specific conditions.

Condition 1: Reduction in Buffer Width Based on Reducing the Level of Impacts from Land Uses

The buffer widths recommended for land-uses that create "high intensity" impacts can be reduced to those recommended "moderate intensity" impacts under the following conditions:

- For wetlands that score moderate or high for habitat in the wetland rating system or other function assessment, the width of the buffer around the wetland can be reduced if both of the following are met:
    1. A relatively undisturbed vegetated corridor at least 100 ft wide is protected between the wetland and other wetlands or between the wetland and a relatively undisturbed, naturally vegetated, upland of 10 acres or more; and
    2. The minimization measures in Table 6 are applied for the type of land use proposed.

- For wetlands that score low for habitat, the buffer width can be reduced to those required for moderate land use impacts if the minimization measures in Table 6 are applied for the type of land use proposed.

Table 10: Some examples of measures to minimize impacts to wetlands from different types of activities.

Activity	Examples of Disturbance	Examples of Measures to Minimize Impacts
Parking Lots, Warehouses	Lights	Direct or shield light away from wetland; reduce wattage of lights,
	Noise	Place activity that generates noise away from the wetland.
	Toxic runoff	Route all new runoff away from wetland
	Change in water regime	Infiltrate or treat, detain & disperse into buffer new runoff from surfaces
Manufacturing	Lights	Direct lights away from wetland
	Noise	Build berms to shield wetland from noise
	Discharge of toxic compounds	Route all new runoff away from wetland Do not Store toxic chemicals within 300 ft
	Change in water regime	Infiltrate or treat, detain & disperse into buffer new runoff from surfaces
High density residential	Lights	All residential lights within 300ft directed away from wetland.
	Pets	Plant dense vegetation around buffer, such as rose, hawthorn, etc.
	Change in water regime	Infiltrate or treat, detain & disperse into buffer new runoff from surfaces
	Residential pesticides	Covenants limiting use of pesticides within 300ft of wetland
	Human disturbance	Plant buffer with "impenetrable" natural vegetation appropriate for region
Tilled fields	Dust	BMP's for dust
	Pesticides	Integrated pest management programs or organic practices or no pesticides within 300 ft of wetland.

Condition 2: Buffer Widths Where Existing Roads Or Structures Lie Within The Buffer.

Where a legally established road or structure extends into the buffer recommended for that wetland, the width of the buffer may be reduced to the existing edge of the road or structure **IF** the new activity proposed does not increase the intensity of the existing disturbances. For example, the widening of an existing road along its upland edge would not likely change the nature or

intensity of the impacts from the existing road if the use of the road does not change. If the road is only 50ft from the edge of a Category II wetland, additional buffer is not needed to provide protection for the wetland. If however, the proposal is to build a shopping center along the upland side of the road, the impacts will increase. This would require the developer to provide a standard buffer extending beyond the road.

Condition 3: Where Natural Limits to Buffer Widths Exist

Cliffs and very steep slopes are one example of site-specific conditions that may not require as wide of a buffer. For instance, assume a compensation site is situated at the base of a 100-ft bluff. The bluff itself could provide a buffer for the portion of the wetland that is adjacent to it and agencies are not likely to require additional buffer area set back at the top of the bluff. Another example includes wetlands adjacent to open water areas. These wetlands won't have buffers on the open water side.

When should a Recommended Buffer Width Be Increased or the Buffer Enhanced?

Agencies may require a wider buffer than those listed in Table 9 when need to ensure that the buffer provides adequate protection for the wetland and its functions. They also may require that a buffer area be either enhanced necessary to protect the wetland.

Condition 1: Enhancing Vegetation in the Buffer

The standard buffer widths are based on the assumption that the buffer is vegetated with a native plant community appropriate for the ecoregion. If the existing buffer is unvegetated, sparsely vegetated, or vegetated with non-native species the buffer should either be planted to create the appropriate plant community or the buffer should be widened to ensure that adequate protection is provided. Generally, improving the vegetation on buffers without an appropriate native community will be more effective than widening the buffer.

Condition 2: Increasing Width Due To Sensitive Species

If the wetland provides habitat for a particularly sensitive species of plant or animal (e.g. state or federally threatened or endangered, state sensitive or candidate species), the buffer width may need to be increased to provide adequate protection for the species based on its particular life history needs.

What is Buffer Averaging?

Buffer averaging means having a wider buffer in some areas and a narrower buffer in others based on differences in adjacent land-uses and wetlands on the site. Buffers may be averaged to provide improved protection to wetland functions or to allow for reasonable use of a parcel. **Averaging may not be used in conjunction with the buffer reduction provisions above.**

Averaging to improve wetland protection may be permitted when all of the following are met:

- The wetland has significant differences in characteristics that affect the habitat functions such as a wetland with a forested component adjacent to a degraded emergent component or a "dual-rated" wetland with a Category I area adjacent to a lower rated area and
- The buffer is increased adjacent to the higher-functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower-functioning or less sensitive portion; and
- The total buffer area after averaging is equal to the area required without averaging; and
- The buffer at its narrowest point is reduced no more than 50% of the standard width.

Averaging to allow reasonable use of a parcel may be permitted when all of the following are met:

- There are no feasible alternatives to the site-design that could be accomplished without buffer averaging; and
- The averaged buffer will not result in degradation of the wetland's functions and values as demonstrated by a qualified consultant's report; and
- The total buffer area after averaging is equal to the area required without averaging; and
- The buffer at its narrowest point is reduced no more than 25% of the standard width.

Wetlands as buffers

In cases where area for an upland buffer is limited or nonexistent, wetland area on the edge can be considered a buffer for rest of the wetland, though the acreage of wetland which is acting as a buffer would not count toward compensation requirements for wetland acreage. ***It is not acceptable to fill wetlands to "create" a buffer for the wetland.***

Summary on buffers

Compensation sites need to have protected buffer areas to protect the site from off site disruptions to its functioning. Buffer width is based on the minimum distance necessary to protect the most sensitive function. Project buffers are determined on a case-by-case basis. To protect the ability of the buffer to protect the site, the buffer boundary should be identified with a semi-permanent marker.

One of the more difficult aspects of landscape-based mitigation involves the decision-making for selecting an **out-of-kind** or **off-site mitigation** alternative. Generally, ***the preferable compensation alternative should provide sustainable ecological benefits that are important to the functioning of the watershed***. The following two sections discuss when to use in or out of kind mitigation and on or off site mitigation.

When do I use "In-kind" versus "Out-of-kind" compensatory mitigation?

Different HGM wetland classes perform different functions and at different levels. Net losses of functions can occur when losses of some functions are exchanged for gains in others or when a different HGM subclass is used for compensation. For example, riverine wetlands provide different functions from, and perform functions differently than, depressional closed wetlands. Sediment retention is one example of the wetlands' differences. A depressional closed wetland will retain sediments while a riverine flow through wetland may provide only detention because annual flooding moves sediment downstream. If a riverine wetland is used to compensate for impacts to a depressional wetland, then a loss of some of the functions provided by depressional wetlands would be expected. If the mitigation projects are designed to replace similar resources and functions that are lost, potential net losses are minimized.

The next pages describe the considerations that agencies use in determining whether a mitigation proposal is appropriate.

In-kind Considerations

In-kind mitigation means replacing the damaged wetland with another wetland of similar hydrogeomorphic (HGM) sub-class (e.g. riverine flow-through, depressional outflow, flats, etc.).

In-kind has also been defined based on plant community and Cowardin class (e.g. palustrine emergent, palustrine forested or estuarine wetlands.) In-kind can also refer to replacement of the same functions as those lost.

According to the February 6, 1990 Memorandum of Agreement between the Corps and EPA (The Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines), **in-kind** compensatory mitigation is generally preferable to **out-of-kind** compensatory mitigation. The preference was based on the assumption that similar wetland types provide similar functions.

In-kind compensation may be required by the agencies when it will provide the greatest ecological benefits for the landscape.

Indicators of when in-kind replacement is environmentally preferable include:

- The affected wetlands and functions are limited or rare within a watershed
- Replacement of the affected functions is important to the maintenance of environmental processes
- The wetland affected are **high quality**[22] or rare and should be replaced in-kind
- Replacement of the same wetland type and functions is needed to satisfy requirements for sensitive or listed species.

NOTE: Impacts to estuarine wetlands must usually be compensated in-kind (i.e., with another estuarine wetland). Freshwater wetlands are rarely acceptable as compensation for impacts to estuarine systems because the importance of the functions provided by estuarine wetlands, their landscape position and their rarity.

Other considerations include:

- The historic losses and conversions of estuarine wetlands in Washington have been extensive
- Estuarine wetlands provide important habitat for threatened and endangered species

It should be noted, however, that the agencies may accept the restoration of estuarine systems as compensation for losses of freshwater wetlands.

Out-of-kind Considerations

There are times when out-of-kind compensation can provide greater environmental benefits than in-kind mitigation. Generally, small impacts to degraded wetland systems may be offset using out-of-kind compensation. The agencies accept out-of-kind compensation when the affected wetlands are dominated by reed canary grass and another invasive species. In these cases, the regulatory agencies prefer to replace the lost wetlands with ones that are appropriate for their landscape setting, support native communities, and maintain **environmental processes**. (For more information on environmental processes, see page 27, Using a Landscape-based approach to compensatory mitigation.)

Out-of-kind mitigation may also be acceptable if the functions or habitats lost are relatively abundant in the area and the compensation will provide functions and habitats that are limited in the watershed. For instance, while estuarine wetlands provide critical habitat areas for fish and wildlife, much of the original estuarine wetlands in Washington

[22] See p. 53 for characteristics of high quality wetlands.

have been lost. As a result, estuarine habitat and shoreline functions are very limited in some river basins, particularly those in the Puget Sound area. Restoration of these habitats is a priority to resource agencies. Thus, in some cases it may be determined that the loss of reed canary grass pastureland in the lower watershed may be adequately offset through the removal of dikes to restore tidal flows and estuarine wetlands habitats.

Out-of-kind compensation may be allowed when:

- The resources affected provide minimal functions and are not considered limited in the landscape or critical for a special species.
- The proposed out-of-kind compensation is demonstrated to be important or limited in the landscape and it provides a net gain for the resources in the watershed.
- It is not possible to replace the wetland type in-kind (see pp.69 for information on replacement ratios).

Guidance for deciding on whether to mitigate in kind or out-of-kind

The state alternative mitigation policy provides a framework for considering mitigation options and key criteria for decision- making. You are encouraged to answer these questions when determining whether to propose in or out of kind mitigation:

1. ***What are the functions, habitat types, or species being adversely affected?***
2. ***Is replacement or reintroduction of those functions, habitat types, or species vital to the health of the watershed?***
3. ***If it is determined that in-kind replacement is not necessary, are there higher priority species, habitat types, or functions that are important to restore?***
4. ***How will the proposed compensatory mitigation maintain, protect, or enhance impaired functions, or the critical or limiting functions of a watershed?***
5. ***Will the proposed compensatory mitigation have a high likelihood of success?***
6. ***Will the proposed compensatory mitigation be sustainable in consideration of expected future land uses?***

Out-of-kind mitigation that is appropriate for its landscape location and which connects into a system of natural areas and aquatic corridors may provide far greater benefits to the

watershed than in-kind replacement. When deciding on what type of mitigation to provide, think about what makes sense ecologically in the landscape.

Where does my Compensatory Mitigation need to be Located?

Historically, applicants have been directed to locate the replacement wetlands on or near the impact site. Early in the use of compensatory mitigation, limited tools existed for quantifying wetland quality and functions. As noted earlier, the 1990 MOA (see p. 19) between the Corps and EPA on wetland mitigation voiced a strong preference for replacement wetlands that were on site and in-kind. In other words, the compensatory wetlands should be of the same kind as the affected wetland and located near to the impacted site. It was widely held that replacing the wetland in the same geographic area would provide the greatest opportunity to compensate for the functions lost at the original wetland. Since then, we've come to recognize that these policies often result in the creation and enhancement of non-typical, low quality wetlands in locations where they do not receive appropriate hydrology and/or are incompatible with the surrounding landscape.

Due in part to this regulatory preference for on-site mitigation, a few things happened. First, project applicants strove to construct the replacement wetlands on the property where the losses occurred. This approach often resulted in unusual (atypical) types of wetlands forced onto sites that couldn't support them. Second, mitigation wetlands located on these properties often experienced high levels of disturbances. Stormwater discharges from paved areas, domesticated cats and dogs, clearing, garbage and landscape debris can affect the functioning of the replacement wetlands. Frequent disturbances, drastically altered water regimes, introduction of invasive species, excess nutrients and toxicants, and pets all degrade the habitat values of the wetland.

In its 2001 compensatory wetland mitigation study, the National Research Council (NRC) found that many mitigation areas were not sustainable because they were incorrectly positioned in the landscape and determined that this occurred, in part, because of a preference for on-site, in-kind mitigation. The NRC also found that some sites were located in the proper landscape position but still threatened by future development in the watershed, demonstrating that landscape position alone is not sufficient to ensure success of compensatory mitigation.

Other research has shown that the location of a wetland can affect it in variable ways. For instance, King (1997b) found that fish and wildlife habitats generally benefit from being surrounded by healthy ecological landscapes that are relatively inaccessible to humans, while other wetland functions, such as sediment and nutrient trapping often generate more benefit when located in or near disturbed landscapes. Some of the

benefits that wetlands provide, such as aesthetics, recreation, education, and flood protection, do not occur in the absence of people.

With the knowledge gained from over 15 years of regulatory experience and scientific research, the regulatory and natural resource agencies are changing their policies to allow more flexibility in determining the best location for compensatory mitigation. Such factors as landscape position, proximity to disturbance, availability of appropriate hydrology, and the needs of the watershed are quickly becoming the primary considerations for locating sustainable, high quality compensatory mitigation.

The Corps, EPA and Ecology consider the location of sites, the surrounding land uses, and ecological conditions when evaluating mitigation proposals. Replacement wetlands should replace and sustain lost resources and functions. The landscape and land uses surrounding and up gradient from a site effect how well a site functions and whether the performance of those functions is likely to be degraded over time. The agencies encourage applicants and local governments to use available information on the landscape and large scale **environmental processes** when selecting and designing mitigation sites.

Considerations for determining where to place your compensatory mitigation

When looking to replace wetland losses, the first search for compensation sites should focus in the immediate drainage basin. The location of a wetland affects the structure (or morphology) of the wetland, the types of functions it provides, and the relative value of those functions. For example, depressional wetlands in the upper portions of a watershed detain surface waters thereby delaying the inputs from storm events from entering streams. Losing these wetlands could result in faster runoff rates after rain events and increased flooding events at downstream locations.

To maximize the replacement of lost functions, compensatory wetlands should be located in a similar position on the landscape as the affected wetlands. If suitable sites are not available in the same basin, applicants should look for suitable sites in basins with similar geology and location in the watershed (upper, middle, lower portions - also referred to as the source, transport and receiving portions of a river basin.)

Applicants are encouraged to seek compensation sites as close to the impact area as possible. The order of preference for locating sites starts in the immediate drainage basin as the impact, then sub-basin, then other sub-basins in the watershed with similar geology; then the river basin, and finally watershed.

Some local governments have mitigation site location requirements in their local regulations. Applicants should contact their local planning department to see if there are any restrictions on off-site compensation.

When deciding where to locate the compensation site, you should consider the following.

Agencies are likely to require on-site compensation when:

- The location is critical for replacing location-dependent functions (for example, water quality and quantity functions.)
- The location plays a critical role in the larger environmental processes and functioning of the watershed (e.g., the site provides a connection to other habitat areas and open spaces, or the site is located along a stream.)
- The on-site location has a high probability of success and is sufficiently protected from off-site pressures (i.e. the site has an adequate buffer.)

Off-site compensation may be preferred to on-site compensation when:

- The impacts are to low quality wetlands or the wetlands perform functions at a low level.
- On-site compensation is not feasible or unlikely to succeed due to adjacent land uses, excessive site disturbances or the presence of highly invasive plant species
- Off-site options can achieve greater benefits or functions than on-site, the off-site compensation can restore or enhance functions that are limiting or important to the health of the watershed.
- The off-site option is a wetland bank, advance mitigation, programmatic mitigation area or in-lieu fee program (See p. 99, Programmatic Mitigation Approaches)

Off-site compensation is usually required to be in the watershed as the impact site. However, occasionally the agencies may agree to compensation outside of the watershed for minor impacts. Considerations include:

- Whether the impact site is located near the boundary of the watershed and suitable sites for compensation are not located in the watershed.
- Whether the geology, topography, plant communities and climate are the similar between watersheds.

You are encouraged to answer these questions when planning compensatory mitigation for unavoidable impacts to wetlands:

1. ***What are the functions, habitat types, or species being adversely affected?***

2. ***Is replacement or reintroduction of the functions, habitat type, or species vital to the health of the watershed, and if so, do they need to be replaced on site to maintain the necessary functions?***

3. ***If it is determined that on-site replacement is not necessary, are there higher priority areas for restoring species, habitat types, or functions that are important in the watershed?***

4. ***If both on- and off-site compensatory mitigation is available, will the functions, habitat type, or species proposed as off-site compensatory mitigation provide greater value to the landscape than those proposed as on-site?***

5. ***How will the proposed compensatory mitigation maintain, protect, or enhance impaired functions, or the environmental processes in a watershed?***

6. ***Will the proposed compensatory mitigation have a high likelihood of success?***

7. ***Will the proposed compensatory mitigation be sustainable in consideration of expected future land uses?***

Acceptable compensation (whether on site or off-site) should be a part of a network or corridor connecting significant habitat areas or other open space areas. When evaluating proposals, agencies keep in mind the natural patterns and corridors in the watershed. As described earlier, rivers and streams are the original freeways for the movement of wildlife, water, sediments and nutrients. Compensatory mitigation should contribute to and preserve these corridors to support the maintenance and functioning of the watershed.

This does not mean, however that it is always preferable to provide compensation off-site. For instance, in urbanized areas small wetlands surrounded by large paved areas, buildings or lawns may provide the only available habitat in a basin. Loss of these areas can further isolate the plant and animal communities in other small wetlands by limiting the amount of habitat available for them to expand into. These small wetlands and their buffers may also provide the only open space and green space in the area. In such cases, rather than moving the wetland resources off-site, for unavoidable impacts the preferred compensation may be the permanent protection of other small urban wetlands which are susceptible to loss and further degradation. Decisions on mitigation alternatives are done on a case-by-case basis and are at the discretion of the regulatory agencies.

WAYS TO COMPENSATE FOR WETLAND LOSSES

In this section, the different ways to compensate for wetland losses are divided into two categories, timing and whether the compensatory mitigation is a single project or part of a large scale compensation approach. Large scale approaches include consolidated mitigation and programmatic forms such as wetland banking. Timing considerations on mitigation sites are not necessarily tied to whether the compensatory mitigation is for a single project or multiple projects and wetland impacts.

Timing of Compensation and Site Development Activities

Timing of mitigation refers to when implementation/completion of the compensation project occurs in relation to when the wetland impact occurs. **Concurrent compensation** refers to the activities to compensate for wetland losses occur at the same time as the activities resulting in the authorized wetland losses. In reality, many compensation projects are implemented as much as one to two years after wetland impacts occur. **Advance compensation** refers to a project is implemented prior to the wetland impacts. The agencies prefer compensation that is performed prior to impacts occurring.

Compensation requirements, particularly replacement ratios, are influenced by the timing of mitigation. For example, if a compensation project is implemented prior to wetland impacts, there is less of a temporal loss. If a compensation project is implemented far enough in advance of wetland impacts that regulatory agencies are able to determine that it has met all its goals, objectives, and performance standards, there is no risk of failure and reduced temporal losses. In such a case, replacement ratios could be 1:1, or perhaps lower if the compensation project provided a higher level of function than the wetland to be lost.

Phased construction and planting

Timing of compensation site development activities can be scheduled for completion at different times. For example, monitoring the baseline of the site prior to performing any activities is a critical first step. The monitoring provides essential information for comparisons with later site performance. Completion schedules will vary depending on the goals of the project and the types of activities to be performed. If the goal of a project is to establish a specific **hydroperiod** or a variety of plant communities, it may be advantageous to wait a year or so after grading has finished to confirm that water regime is appropriate before planting. This can help alleviate problems with plant mortality due to too much or too little water. For a forested wetland, phased planting may be appropriate, such that deciduous species are planted initially and after a canopy has been established, shade tolerant coniferous species could be under-planted.

NOTE: Most permits and approvals require applicants to notify regulatory agencies prior to starting on-site construction activities. In addition, for large projects, it may be beneficial to arrange a pre-construction on-site meeting with regulatory agencies and the contractor who will be implementing the mitigation plan to ensure that the sites goals and design are clear and the contractor understood the expectations of the regulatory agencies.

Wetland losses can be compensated either singly or in conjunction with other compensatory mitigation.

Project-specific mitigation

Individual project mitigation

When an applicant proposes a project that will unavoidably damage wetland resources, they propose a compensation package which is designed to meet the permit requirements for their project. Usually, these proposals are stand alone projects. In other words, they design the compensatory mitigation to meet the requirements only for the one project. Such proposals are considered individual project mitigation. In most cases, the applicant implements the compensatory mitigation at the same time that wetland impacts occur or shortly after the impacts occur. Currently, individual project mitigation is the most common approach to compensating for wetland losses.

Individual project mitigation can occur on the project site or off-site and provide either in-kind or out-of-kind mitigation. Historically, most individual mitigation projects were designed to achieve a range of wetland functions on the project site.

Advance mitigation

Advance mitigation is another option for meeting regulatory requirements for wetland replacement. While most individual compensatory projects are constructed at the same time or after wetland impacts have occurred, advance mitigation involves the establishment of a mitigation site prior to, and in anticipation of, future project impacts. Most often, advance mitigation is used for large projects that are scheduled to be constructed in distinct phases. Advance mitigation allows an applicant to provide all of the compensatory mitigation necessary for the complete proposal at one time. If the advance mitigation is successful, this approach will often result in lower replacement ratios required for later phases of the project since the compensation has already been established and functioning so that the temporal losses and risk of failure of the compensatory mitigation are reduced.

While similar to wetland banking because the compensatory mitigation occurs before wetland impacts occur, advance mitigation is different from mitigation banking in several

ways. One key difference is that advance mitigation is for *known wetland impacts*, whereas a wetland bank project does not need to have specific impacts or debit projects determined in advance. Since advance mitigation is for known impacts, it does not usually include a service area (area where the compensation can be used for impacts.) Additionally, advance mitigation credits are generally not transferable to other projects. Applicants should be aware that projects that do not meet the criteria for advance mitigation should be established as mitigation banks.

Requirements for Advance Mitigation:

1. The mitigation is for a specific project (or projects) and known wetland impacts.
2. Advance mitigation is usually not transferable to other projects should the original project not be constructed. Advance mitigation is at the applicant's own risk.
3. In the event that the project(s) that plan to use the advance mitigation do not occur, the project proponent is encouraged to obtain a wetland bank approval (certification) for the mitigation project in order for agencies to allow the use of this mitigation for other projects.
4. Detailed pre-project baseline monitoring information and documentation of the development of the advance mitigation project will be required. This information and documentation will be necessary if bank certification for the mitigation is sought at a future time.

Advance mitigation is not a substitute for the wetland banking review and approval process. Compensatory wetland mitigation which is not associated with specific wetland impacts will need to follow the procedures and requirements for wetland banking.

Excess Mitigation

The regulatory agencies determine compensatory mitigation ratios and requirements based on the function and value of the wetlands and other aquatic resources being impacted by a proposal. Compensatory mitigation requirements must be commensurate with the impacts. The analysis of the "rough proportionality" of impact to mitigation is presented in the Corps decision document for a project. In some cases, an applicant voluntarily offers to do mitigation above and beyond what the Corps and Ecology require.

The resource agencies acknowledge that there are times when it makes ecological and economic sense to perform mitigation activities above and beyond those required by the permit process. If a mitigation site has the ability to support more wetland area than is required, and a candidate proposal(s) is anticipated to occur in the area in the relatively near future, then, at times, it may make sense to mobilize construction equipment and

planting crews only once. It also allows landscape architects and wetland mitigation designers to look more holistically at a site within a particular landscape setting and/or watershed where the compensatory mitigation is being performed. In addition, just like advanced mitigation and banking, it allows the mitigation site to develop functions before the impacts occur from a future anticipated project and reduces the temporal loss from the project's aquatic impacts.

However, there appears to be a trend of providing additional mitigation and subsequently coming back to the Corps and Ecology to request that this "excess" mitigation be applied to another project impacting wetlands within the same vicinity or watershed. At times the applicant requests, upfront during the application process, that excess mitigation be credited or "banked" for future projects. Since we have formal processes established for wetland mitigation banking and advanced mitigation, the resource agencies, in general, don't support creating unofficial banks or excess mitigation. Allowing applicants to unofficially "bank credits" or perform advanced mitigation circumvents the federal and state processes set up for these types of actions.

If an applicant performs additional mitigation beyond what is required in the CWA Section 404/401 permit in hopes that they may use this for future projects, they do so at their own risk. The resource agencies are not under any obligation to acknowledge this unofficial mitigation as compensation for additional impacts. While the resource agencies do reserve the right, on a case-by-case basis, to consider such unofficial mitigation, when a future project within the same basin or sub-basin is presented for review, the agencies seldom accept this type of mitigation. Therefore, it behooves the applicant to consider consolidating compensatory mitigation for projects beyond the one being authorized *prior* to initiating the permit process so the correct approach can be coordinated and the applicant gets assurance that the mitigation they are proposing can be utilized for future projects. Applicants should also be aware that documentation of existing conditions and assessment of functions at the compensation site is necessary so that gains in area and function can be determined in the future.

Programmatic mitigation approaches

The following four approaches - consolidated mitigation, wetland banking, in-lieu-fee, and programmatic mitigation areas - can all provide an easily accessible option for consolidating various wetland impacts in an environmentally preferable manner. Programmatic approaches provide a structure where the planning and implementation of the compensatory mitigation is done based on landscape considerations with a focus toward restoring and maintaining environmental processes.

Consolidated Mitigation

Consolidated mitigation generally involves the consolidation of two or more individual wetland compensatory mitigation projects onto a single site. The mitigation can be developed together as one project or at different times on a single site. Consolidated mitigation can provide some of the economic and environmental benefits of banking through economies of scale and providing larger blocks of wetland mitigation and habitat. While it does not require the same level of complexity of wetland banking, timing and coordination between projects using the consolidated site can be difficult. Usually, the project impacts are well defined and the mitigation projects are approved separately. Consolidated mitigation can be done by a single user, such as a public works department which has multiple projects in a general area, or by two or more users who cooperate on the site development to share costs and logistical resources.

Consolidated mitigation can take place at the same time as the impact projects or in advance of impacts. This option has not been widely used in Washington to date. There is potentially a lot of utility to this option, and the agencies encourage applicants to consider it when evaluating options for compensation.

Wetland Banking

Although the concept of mitigation banking has been around since the 1970s, it is only recently that it has become widely used as a regulatory tool. Mitigation banking involves the generation of credits through restoring, creating, enhancing and, in exceptional circumstances, preserving wetlands and other aquatic resources. These credits can then be sold to permit applicants who need to offset the adverse environmental impacts of projects that would occur within the service area of the bank. A bank's service area is akin to its "market area" or the area in which credits may be sold or used. Projects that use bank credits as compensation are called "debit projects." Mitigation banks benefit the aquatic environment by consolidating numerous small wetland mitigation projects into larger, potentially more ecologically valuable projects, which results in economies of scale that benefit the regulated public, regulatory agencies, and, most importantly, the environment. Another important feature of mitigation banks is that they are developed in advance of many the adverse impacts for which they compensate. This ensures that the bank is at least partially ecologically successful before it is used to offset adverse impacts at other sites. Properly implemented mitigation banks offer improved ecological performance, lower mitigation costs to permit applicants, and a more streamlined permit process.

To date, few banks have been approved in Washington. However, the regulatory encourage their establishment and use. As the agencies complete more bank review and approval processes and gain experience in evaluating mitigation bank proposals, the permitting process is anticipated to be more less time consuming. The agencies anticipate that mitigation banks are likely to become more common in Washington.

Wetland mitigation banks have three basic components:

- The physical site where mitigation bank "credits" are generated by restoring, creating, enhancing and/or preserving wetlands and associated natural resources.

- An organization operating under the provisions of a mitigation banking instrument that markets and sells credits, maintains a bank ledger, monitors and reports on the development of the bank site, and provides perpetual protection, management, and other services for the bank site.

- A Mitigation Bank Review Team or interagency oversight committee which provides oversight on the bank.

Bank sites are normally protected in perpetuity by a legally binding protective covenant such as a conservation easement held by a long-term manager. Bank sponsors must also provide one or more temporary financial assurances to ensure the successful ecological functioning of the bank as well as an endowment to fund long-term management of the bank site(s).

Once released for sale, wetland bank credits are sold to permit applicants to compensate for wetland impacts that occur within a specific geographic area known as the "service area" of the bank. As credits are sold, bankers debit them from the bank's ledger so they cannot be resold. Once all credits in a bank have been sold, the bank is closed.

Use of Credits

As with any form of compensatory mitigation, the use of mitigation bank credits to offset impacts to the aquatic environment is not generally considered prior to completing the two mitigation sequencing steps of avoidance and minimization. Then, the regulatory agencies must determine whether purchasing credits from a particular bank would provide appropriate and practicable compensation for a proposed impact. In making their determination, the regulatory agencies consider whether any environmentally preferable compensatory mitigation opportunity (e.g., on-site mitigation) is available, how closely a bank's credits correlate with the particular wetland functions that would be destroyed by a proposed action, and whether using a bank to compensate for a proposed action would be in the best interest of the aquatic environment, particularly the affected watershed.

Current Policies

The 1998 Washington State Legislature found that wetland mitigation banks are important tools for providing compensatory mitigation for unavoidable impacts to wetlands and that banking provides certain benefits over concurrent mitigation. Further, they found that the success of concurrent mitigation is extremely variable and that compensatory mitigation usually occurs after the impacts to wetlands have occurred,

resulting in temporal losses of important wetland functions. In many cases, concurrent mitigation fails, resulting in a complete loss of wetland functions.

The federal agencies adopted guidance on wetland banking in 1995. For detailed guidance on wetland bank approval processes and requirements see the federal guidance on wetland banking and the state's draft wetland bank rules (p.13, State Laws and Rules).

What is "In-Lieu Fee" Mitigation?

"In-lieu fee" (ILF) mitigation occurs when an applicant pays a fee to a third party instead of conducting project-specific compensatory mitigation, purchasing credits from a mitigation bank, or conducting some other form of compensatory mitigation. This fee represents the expected costs for a third party to replace the aquatic ecosystem functions that will be lost or impaired as a result of the applicant's project. Fees are typically held in trust by a non-profit conservation organization until they can be combined with other Fees to finance a project that replaces the lost and impaired functions represented by those ILFs. The entity operating the trust is typically an organization with demonstrated competence in natural resource management, such as a local land trust, private conservation group, or governmental natural resources management agency.

ILF mitigation is used primarily to compensate for minor adverse impacts to wtlands when more preferable forms of compensation are not available, practicable, or in the best interest of the environment. Compensation for projects that result in more substantial adverse impacts is usually provided by project-specific mitigation or a mitigation bank.

ILF mitigation may be appropriate when:

- the amount of compensatory mitigation required for a project is too small to justify the cost of designing and implementing project-specific mitigation;
- practicable opportunities to conduct appropriate project-specific mitigation or purchase credits from an approved mitigation bank are not available;
- project-specific mitigation that could be implemented would likely result in a low-performing aquatic system, have a high risk of failure, be incompatible with adjacent land uses, or fail to address the needs of the landscape; or
- a minor amount of additional mitigation is needed to supplement project-specific mitigation that would not, by itself, fully compensate for a project's adverse environmental impact.

ILF mitigation and mitigation banking share many similarities. For example, both types of mitigation allow permittees to fulfill their compensatory mitigation responsibilities by paying a fee to a third party who will accept responsibility for the required mitigation. Also, mitigation banks and ILF-funded projects must both fully comply with existing

federal mitigation guidance and policy, including a requirement for a written implementing agreement that normally includes construction plans, performance standards, monitoring and reporting provisions, a long-term management plan, financial assurances, protective real estate agreement (e.g., **conservation easement**), and other measures, as appropriate, to ensure the ecological success of each project.

The fundamental difference between mitigation banking and ILF mitigation is the relative *timing* of the activities that offset the adverse environmental impacts for which they compensate. With mitigation banks, the environment-enhancing activities are conducted in advance of the adverse impacts, while with ILF mitigation, those activities are normally not conducted in advance of the adverse impacts. While specific ILF-funded mitigation projects may not always be identified in advance of project-related impacts, quickly expending collected ILFs to fund mitigation projects is generally a high priority for any ILF program. Because of this timing difference between these two types of mitigation, most regulatory agencies generally prefer mitigation banks, all other factors being equal. It should be noted that regulatory agencies may adjust the size of ILFs to compensate for anticipated delays in expending them.

In Washington, the Corps and Ecology have approved the use of ILF mitigation on a case-by-case basis, generally when other forms of compensation are not available, practicable, or appropriate. In such situations, the permit applicant must identify the third party recipient of the fee, and both parties must describe to the agencies in a written mitigation plan specifically how and when the fee would be used to compensate for the impact of the applicant's project. The plan must also describe how the ILF-funded mitigation will provide appropriate and practicable compensation for the impact. The mitigation plan must include the provisions and assurances necessary for any ILF-funded project.

The agencies are discussing the establishment of an ILF program framework in Washington. Such a framework would not itself initiate any local or regional ILF trust fund but would establish a process for managing collected fees, procedures for evaluating, approving, and funding ILF-funded activities, and rules for coordinating among program participants. Once a framework it established, a wide variety of individual ILF trust funds could be established as the need arises throughout the state. While it is too early to predict the specific form or features of a Washington ILF program, its basic goals would be to: (1) increase the overall quality of compensatory mitigation for projects with minor impacts and (2) provide permit applicants another option for effectively compensating for the adverse environmental impacts of their projects when other forms of compensatory mitigation are not available or preferable.

Programmatic mitigation areas

Another approach for consolidating compensatory wetland mitigation involves directing compensation projects to an area or site that has been identified by the local community as an important area for restoration rehabilitation. Simply defined, a programmatic

mitigation area is a site (or series of sites) that have been identified by the local jurisdiction, state or federal agency as the preferable site(s) or area for wetland compensation. Compensatory projects may be constructed separately on the site but all are part of a common design. Programmatic mitigation sites are subject to the same minimum requirements as other compensation sites such as long-term protection, monitoring requirements, restrictions on activities on the site, etc.

The goal of programmatic mitigation is to allow the restoration of larger wetland areas that are important to the functioning of a stream basin or watershed because of their position. Since many compensatory requirements are for relatively small wetland areas, the programmatic mitigation area program allows the consolidation of these small compensation sites into a larger project.

This approach has been used to a limited extent in Washington. One example is Kitsap County's work along Clear Creek where several mitigation projects have been completed adjacent and complementary to each other. The county has actively directed compensation projects to the Clear Creek area. A second example is along Mill Creek near Auburn in King County. There, the Emerald Green Race Track and WSDOT located their compensation sites in an area identified for restoration in the draft Mill Creek Special Area Management Plan. A third example can be seen in the lower Snohomish River estuary. This area has elements of a programmatic mitigation area supported by the inventory and restoration priorities identified in the Snohomish Estuary Wetland Integration Plan (SEWIP.) Several compensatory wetlands lie adjacent to the river and sloughs within the SEWIP area. Together, these sites are anticipated to provide significant benefits to the watershed and its wildlife. Finally, WSDOT developed a programmatic mitigation agreement with Ecology to provide consolidated compensation for small, ongoing impacts to wetlands in the Willapa Bay watershed.

How might a programmatic mitigation area program work?

1. The lead regulatory entity (e.g. county or city jurisdiction, state or federal agency) identifies an area or areas which are priority restoration areas.
2. The regulatory entity might develop a site plan for the entire site or identify preferred restoration actions.
3. As projects needing compensation occur, the applicants may be directed to perform either certain activities on the site (to aid in the completion of the plan) or directed to implement the site design on specific areas within the overall site.
4. The program needs to clearly identify who is responsible for the successful establishment of each mitigation area and who is responsible for the long-term protection and management of the programmatic mitigation area.

The agencies support programmatic mitigation areas and approaches that are integrated with watershed planning and focus on high priority areas for restoration. As with any mitigation area, programmatic areas must be protected for the long-term.

WHAT ARE RESOURCE TRADE-OFFS?

Resource trade-off decisions can mean the replacement of wetland losses with habitats or ecosystems other than wetlands, such as upland riparian restoration, stream rehabilitation, or preservation of mature forest lands, dune systems, or shrub/steppe communities.

Generally, compensatory requirements for wetland losses involve the replacement of wetland functions for those lost. In some limited cases, however, the agencies have allowed applicants to provide some of their compensatory requirements with non-wetland resources, such as riparian restoration, when the functions provided by those resources are limiting in the watershed or are critical for restoring the health and functioning of the landscape and environmental processes. When agencies allow resource trade-offs, wetland losses are usually required to be replaced on a 1 to 1 basis with the non-wetland compensation being used to make up the difference in the replacement ratios. For example, a one-acre wetland fill may require the creation or restoration of one acre of wetland along with five acres of riparian restoration. Each request for compensation with non-wetland resources will be evaluated on a case-by-case basis.

In some cases, where the impacts occur to a highly degraded wetland which provides low levels of wetland functions, it may be environmentally preferable to allow the protection of high quality wetland and upland habitats which are important to the watershed and under threat in lieu of replacing those wetlands.

To make reasonable and appropriate decisions on resource trade-offs for wetland mitigation, it is necessary to have the proper context. The agencies need to have important information on the condition and functioning of the watershed or basin in order to determine that the net effect of the trade-off will be positive for the watershed. In areas where watershed planning is underway, some of the information may already be available. Some of that information includes:

- Identification of limiting resources or functions in the area
- The degree of permanent disruptions to landscape processes such as the way water moves through the landscape
- Key areas identified for restoration
- Key areas identified for protection and preservation

STORMWATER AND WETLAND MITIGATION

It has become virtually impossible to separate wetland and stormwater issues when dealing with projects in urban areas. In many cases wetlands receive all or part of their water from storm water. Generally, stormwater facilities have not been considered acceptable mitigation for the loss of wetland areas. The interest in integrating mitigation for water quality and quantity functions when wetlands are lost with stormwater mitigation has grown considerably in the last decade. Currently, the agencies are working on guidance for when stormwater facilities may be included as part of a mitigation package and design requirements and recommendations.

Can stormwater facilities be used as wetland mitigation?

Generally, the answer is no. The agencies rarely allow the use of stormwater facilities to be used for compensation for several reasons.

1. The stormwater facilities are generally designed to address the water quantity and quality impacts from additional impervious surfaces and changes to water flow patterns on the site (primarily conversions from infiltration of precipitation to surface runoff) that result from the proposed land use change. They are generally not designed to address the water quality and quantity functions lost when wetland are lost.
2. Typical stormwater facilities such as detention basins and vaults do not provide the same types of functions as wetlands provide. They also tend to have water regimes which are very different in depth, timing and duration from natural wetlands.
3. Most stormwater facilities are so degraded or intensively managed that they cannot provide the range of necessary wetland functions.
4. Stormwater facilities are not regulated as "waters of the state" whereas compensation wetlands are afforded the same levels of protection as natural wetlands.

There has been a growing interest on the part of project applicants to incorporate stormwater facilities as part of their wetland compensation package. The agencies are currently working on guidance and requirements for when stormwater facilities and wetland mitigation can be combined. When that guidance is developed, it will be added to this guidance document.

The agencies have allowed some clean storm water[23] to be used as a water source mitigation sites. Mitigation sites using roof runoff or other stormwater source will need

[23] Clean storm water is run off that does not flow over areas where it could pick up contaminants such as parking lots or lawn areas. Roof run off from buildings is generally considered clean provided that the roofing materials are not ones which can release pollutants. Galvanized roofs are an example of non-suitable roofs since rain on the roof can pick up zinc contamination from the roof materials.

extensive modeling to determine the appropriate size and topography for the mitigation site. This use of stormwater can be beneficial to the water cycle in the basin if there is an attenuation of the flows leaving the wetland after storm events and/or some of the flows infiltrate into the soil profile.

WHAT ABOUT MITIGATION FOR OTHER AQUATIC RESOURCES?

Compensation may be required for impacts to other aquatic resources aside from wetlands. While this document focuses on mitigation for freshwater wetlands, the mitigation policies, guidance and concepts discussed herein are relevant to other aquatic resources (such as marine, estuarine and other freshwater systems). Specific mitigation requirement for impacts to other aquatic resources should be discussed with the appropriate permitting agencies.

Various information sources exist that address mitigation in other aquatic systems. WDFW's "Integrated Streambank Protection Guidelines" is especially worth reviewing for impacts to riverine systems.

CONCLUSIONS ON COMPENSATORY MITIGATION

The recommended approach to compensatory mitigation is doing what makes the most ecological sense in the landscape. This includes using information in watershed plans and GIS databases to guide site selection and design. When a science-based resource inventory or restoration plan already exists in the area of the project, considering that plan in should be a priority. The preferred compensation should have the greatest potential to replace or improve on what is being lost in a sustainable manner.

The agencies' goals for this document (both Parts 1 and 2) on wetland mitigation are to improve on the success of compensatory mitigation. This document outlines the rationale agencies use to determine whether specific mitigation proposals are appropriate. Several key points have emerged in reviewing the success of compensatory mitigation over the past 15 years.

The Corps, EPA and Ecology identify the following recommended actions to assist applicants in selecting, designing and implementing successful and appropriate compensatory mitigation and gaining agency approval of the compensation.

Sequence Mitigation

Mitigation sequencing must be applied before determining whether compensatory mitigation can be used. Applicants need to avoid and minimize any impacts to wetlands.

Assess functions

Regulatory agencies will usually request some assessment of level of function performed by compensatory wetlands. Often, wetland functions must be assessed or measured at both the impact site and the compensatory mitigation site.

Replace what's been lost

Compensatory wetlands should be located and designed to address lost resources and functions and be sustainable in the landscape. Requirements for compensation are relative to the level and degree of impact. Replacement ratios provide guidance while specific compensation requirements are determined by the agencies on a case-by-case basis. Mitigation proposals usually include: goals and objectives, performance standards, monitoring, maintenance, buffers, and permanent protections.

Consider the landscape

The landscape and land uses surrounding and up gradient from a site effect how well a site functions and whether the performance of some functions is likely to degrade over time. The agencies encourage applicants and local governments to use available information on the landscape and large-scale environmental processes (e.g. information on surficial geology and hydrologic processes and routes) when selecting and designing mitigation sites.

First look for mitigation sites near the impact

Applicants are encouraged to seek compensation sites as close to the impact area as possible. The order of preference for locating sites starts in the immediate drainage basin as the impact, then sub-basin, then other sub-basins in the river basin with similar geology; then the river basin, and finally in the watershed.

On-site replacement isn't always the best choice

On-site replacement of wetlands is not always the preferred option for mitigation and that the most ecologically beneficial alternative, whether on-site, off-site, in-kind, or out-of kind, should be given preference. Compensation mitigation alternatives which contribute to the functioning of a larger landscape are more preferable than simply attempting to replace acreage on site.

Restore wetlands and environmental processes when possible

Re-establishment and rehabilitation are the preferred approaches for compensation when available. Applicants should strive to replace wetland area and function through re-establishment, rehabilitation or creation before considering the use of enhancement or preservation.

One final note: Applicants are encouraged to coordinate early with the appropriate regulatory agencies for information on permit requirements and processes. Rules and requirements change. If your project may affect a wetland, please contact your local jurisdiction, the Corps and Ecology staff before you begin work.

LIST OF ACRONYMS AND ABBREVIATIONS

AO…….....Administrative Order

BAS……..Best Available Science

BMPs……...Best Management Practices

BPJ……...Best Professional Judgement

CAO……Critical Area Ordinance

CFR …….Code of Federal Regulations

cfs…….cubic feet per second

Corps or USACE…….United States Army Corps of Engineers

CWA……Clean Water Act
(also known as the Federal Water Pollution Control Act)

CZM (A)……..Coastal Zone Management (Act)

Ecology……Washington State Department of Ecology

EFH…….Essential Fish Habitat

ESA……..Endangered Species Act

EPA or USEPA……....United States Environmental Protection Agency

FR…….Federal Register

GMA……Growth Management Act

HGM…….Hydrogeomorphic

HPA……..Hydraulic Project Approval

ILF……In-Lieu Fee

MOA……Memorandum of Agreement

MSA…….Magnuson-Stevens Act

NEPA……National Environmental Policy Act

NHPA……..National Historic Preservation Act

NOAA Fisheries……...National Oceanic and Atmospheric Administration Fisheries (previously known as the National Marine Fisheries Service)

NRC…….National Research Council

NRCS……...Natural Resource Conservation Service, US Dept. of Agriculture

NWMAP…….National Wetland Mitigation Action Plan

NWP……Nationwide Permit

OHWM……Ordinary High Water Mark

PCC…….Prior Converted Cropland

RCW……Revised Code of Washington

RGL…….Regulatory Guidance Letter

SEPA……State Environmental Policy Act

SMA…….Shoreline Management Act

USC……..United States Code

USFWS……United States Fish and Wildlife Service

WAC……Washington Administrative Code

WAFAM……..Washington Function Assessment Methods

WDFW……Washington State Department of Fish and Wildlife

WQC……....Water Quality Certification

WRIA……...Water Resource Inventory Area (see Ch. 173-500 WAC)

§ ……..Section (e.g. Section 404 of the CWA)

GLOSSARY

Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of actions. Related to compensatory mitigation, it involves the applicant and the regulatory agencies discussing the problems occurring on a compensation site and coming to agreement on possible solutions or alternative approaches necessary to bring the site into compliance.

Advance compensation means that a compensation project is implemented prior to the wetland impacts.

Assessments generate a number that represents an estimate of the performance of each specific wetland function. The number generated, the estimate of function performance, is relative to a predetermined standard (e.g., level of function provided by reference wetlands). Numbers do not reflect an actual level of function performance (Hruby 1999). Examples include the Washington State Methods for Assessing Wetland Functions (WAFAM) (Hruby et al. 1999 and 2000) and the HGM approach to wetland function assessment (Brinson et al. 1995).

Atypical wetland refers to a compensation wetland that alters the hydrogeomorphic setting of a site and, therefore, is not appropriate for its position in the landscape. For example, excavating depressions to "enhance" a slope wetland is "atypical" because depressional wetlands are not appropriate on a slope.

Buffers or buffer areas are vegetated areas adjacent to wetlands, or other aquatic resources, that can reduce impacts from adjacent land uses through various physical, chemical, and/or biological processes.

Beneficial Uses are more or less equivalent to wetland "functions and values" and include: water supply, surface and groundwater treatment, stormwater attenuation, fish and shellfish migration, rearing, spawning, and harvesting, wildlife habitat, recreation, support of biotic diversity, and aesthetics.

Characterizations group wetlands based on their distinguishing traits or qualities (Hruby 1999). For example, Ecology's Wetland Rating System assigns wetlands to Category I, II, III, or IV based on their distinguishing traits or qualities.

Concurrent compensation means that the activities to compensate for wetland losses occur at the same time as the activities resulting in the authorized wetland losses.

Conservation easement is a restriction placed on a piece of property to protect the resources (natural or man-made) associated with the parcel. The easement is either voluntarily sold or donated by the landowner, and constitutes a legally binding agreement that prohibits certain types of activities from taking place on the land.

Contingency plan outlines actions that would be triggered if project monitoring revealed a problem that would prevent the site from attaining its stated goals, objectives, and performance standards. Contingency plans should identify anticipated problems and the specific maintenance activity that would be implemented to rectify each problem.

Critical areas as defined by the Growth Management Act RCW 36.70A.030 "include the following areas and ecosystems: (a) Wetlands; (b) areas with a critical recharging effect on aquifers used for potable water; (c) fish and wildlife habitat conservation areas; (d) frequently flooded areas; and (e) geologically hazardous areas". Basically, critical areas are those areas that should have some development limitations due to the benefits that those areas provide to society or to the dangers that those areas present to society if developed.

Cultural Resources are any archaeological, historical, or cultural (e.g. religious significance) areas of concern (this term is a catch all term that is not defined in any Federal Statute or regulation).

Deed Restriction An imposed restriction in a deed (a signed, written instrument that conveys title to real property) that limits the use of the property.

Dredge/Dredging Any physical digging into the bottom of a water body. Dredging can be done with mechanical or hydraulic machines and is performed in many parts of Puget Sound for the maintenance of navigation channels that would otherwise fill with sediment and block ship passage. Dredging is also done to clean up contaminated sediments.

Environmental Processes means the conditions that control long-term patterns of structures, ecosystems and functions in the landscape. These include the movement of water, sediment, nutrients, energy, plants, and animals in the landscape, and the factors that control this movement - climate, geology, soils, topography.

Federal undertakings, for this document, means issuing a Department of the Army permit by the Corps.

High Quality wetlands In general, a high quality wetland is important to the ecosystem or landscape; it supports an appropriate native community; and it performs important functions. See page 52 for evaluation criteria.

Historic property is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register of Historic Places, including artifacts, records, and material remains related to such a property or resource. Historic properties are protected by Section 106 of the NHPA.

Hydrogeomorphic or HGM A system used to classify wetlands based on the position of the wetland in the landscape (geomorphic setting), the water source for the wetland, and the flow and fluctuation of the water once in the wetland.

Hydroperiod or water regime refers to the pattern of water level fluctuations in a wetland. Includes the depth, frequency, duration, and timing of inundation or flooding. Patterns can be daily, monthly, seasonal, annual or longer term.

In-kind mitigation is defined by the 2001 State of Washington Alternative Mitigation Policy Guidance as "replacing the same species, habitat type, and function as those affected. However, disturbed habitat shall not be replaced with additional disturbed habitat. In these cases the applicant must restore the site to its natural condition based on adjacent undisturbed sites, as approved by the permitting agencies."

Invasive Species is defined by the National Invasive Species Council (NISC) as (1) "a non-native (alien) to the ecosystem under consideration and (2) a species whose introduction is likely to cause economic or environmental harm, or harm to human health"(Executive Order 13112).

Mitigation banking has been defined as "wetland restoration, creation, enhancement, and in exceptional circumstances, preservation undertaken expressly for the purpose of compensating for unavoidable wetland losses in advance of development actions, when such compensation cannot be achieved at the development site or would not be as environmentally beneficial." 1995 Federal Guidance on Wetland Mitigation Banking

Navigable waters Navigable Waters are those waters that are subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past or may be susceptible to use to transport interstate or foreign commerce. These are waters that are navigable in the traditional sense where permits are required for certain activities pursuant to Section 10 or the Rivers and Harbors Act.

Off-site mitigation means that the replacement wetlands are not provided on or near to the project affecting wetlands. Off-site mitigation is often only allowed if mitigation on the project site is not practicable or if it is environmentally preferable to on-site compensation (Ecology et al. 2001).

Out-of-kind mitigation means that the compensatory wetlands and the associated functions provided are of a different kind than those that were lost. Out-of-kind mitigation is a fairly common practice, for example, when the affected wetlands are highly degraded (e.g., wet pastures dominated by exotic species), they may be replaced by a native scrub-shrub wetland.

Ratings group wetlands according to a qualitative scaling of function performance, such as high, medium, or low (Hruby 1999). The wetland evaluation technique (WET) (Adamus et al. 1987) is an example of a wetland rating method. The wetland and buffer functions semi-quantitative assessment methodology (SAM) (Cooke 2000) is an example of a wetland rating method for the Puget lowlands of western Washington.

State Historic Preservation Office is the Washington State Office of Archaeology and Historic Preservation.

Tribal Historic Preservation Office includes one of 4 tribes in Washington State: the Makah Tribe; the Skokomish Indian Tribe; the Confederated Tribes of the Colville; and the Spokane Tribe.

Tribal lands are defined as all lands within the boundaries of an Indian Reservation, whether they are tribally or independently owned.

Waters of the State include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and watercourses within the jurisdiction of the state of Washington (90.48.020).

Waters of the United States Taken from 33 CFR 328.3 means "(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) All interstate waters including interstate wetlands;
(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa takes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
(ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
(iii) Which are used or could be used for industrial purpose by industries in interstate commerce;
(4) All impoundments of waters otherwise defined as waters of the United States under the definition;
(5) Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
(6) The territorial seas;
(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(l)-(6) of this section. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.
(8) Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands Definition taken from the *Washington State Wetlands Delineation Manual* (Ecology 1997). "The Corps of Engineers (CE) (Federal Register 1982), the Environmental Protection Agency (EPA) (Federal Register 1985), the Shoreline Management Act (SMA) and the Growth Management Act (GMA) all define wetlands as: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a

prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. In addition, the SMA and GMA definitions add: "Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands."

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WEB ADDRESSES FOR HYPERLINKS[24]

Page # (s)	Referenced Document and Internet Address
i	*Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals*, **Ecology Publication #94-29** http://www.ecy.wa.gov/programs/sea/pubs/94-029/94-029.html
i	"Compensating For Wetland Losses under the Clean Water Act" http://www.nap.edu/books/0309074320/html/
i, 29	National Wetlands Mitigation Action Plan http://www.mitigationactionplan.gov/index.html
i	*How Ecology Regulates Wetlands,* **Ecology Publication #97-112** http://www.ecy.wa.gov/biblio/97112.html
1	Wetlands Home Page http://www.ecy.wa.gov/programs/sea/wetlan.html
3	Office of Regulatory Assistance http://www.ecy.wa.gov/programs/sea/pac/
3	Corps http://www.nws.usace.army.mil/reg.html (Go to "Contact Our Staff")
3	Ecology regional wetland specialist http://www.ecy.wa.gov/programs/sea/wetlandcontacts.htm
7	Special Public Notice – July 23, 2002 http://www.nws.usace.army.mil/reg.html (Go to "Nationwide Permits," "2002 NWPs", "Part 1")
7	Regulatory Guidance Letter 90-07 http://www.sac.usace.army.mil/permits/90-07.html
7, 14	Washington State Wetland Identification and Delineation Manual Ecology Publication #96-94 http://www.ecy.wa.gov/biblio/9694.html
7	Solid Waste Authority for North Cook County v. US Army Corps of Engineers http://www.epa.gov/owow/wetlands/2001supremecourt.pdf
8	Isolated Wetlands Focus Sheet. http://www.ecy.wa.gov/biblio/0106020.html
16	*Water Quality Guidelines for Wetlands: Using the Surface Water Quality Standards for Activities Involving Wetlands*. Ecology publication # 96-06. http://www.ecy.wa.gov/pubs/9606.pdf
19	Memorandum of Agreement (EPA and Dept. of the Army on Mitigation) http://www.epa.gov/owow/wetlands/regs/mitigate.html
20, 41, 57	Regulatory Guidance Letter 02-02 http://www.usace.army.mil/inet/functions/cw/hot_topics/RGL_02-2.pdf
20	Multi-Agency Guidance (for mitigation banks) http://www.epa.gov/owow/wetlands/mitbankn.html

[24] For web addresses for the following types of hyperlinks refer to the On-line Resources (Government sites): USC, RCW, WAC, CFR, FR.

21	Multi-Agency (Corps, EPA, USFWS, and NOAA Fisheries) Guidance (on in-lieu-fees) http://www.epa.gov/owow/wetlands/pdf/inlieufee.pdf
21	Memorandum (on Conservation Banks) http://endangered.fws.gov/policies/conservation-banking.pdf
21	National Wetlands Mitigation Action Plan (also see above, page i) http://www.epa.gov/owow/wetlands/pdf/map1226withsign.pdf
22	Executive Order 11988 (Protection of Floodplains) http://www.epa.gov/owow/wetlands/regs/eo11988.html
22	Executive Order 13112 (Invasive Species) http://www.invasivespecies.gov/laws/execorder.shtml
23	Executive Order 11990 (Protection of Wetlands) http://www.epa.gov/OWOW/wetlands/regs/eo11990.html
23	Guidance (on Cranberry Bogs) http://www.nws.usace.army.mil/publicmenu/DOCUMENTS/ACF101C.pdf
25, 50	*Alternative Mitigation Policy Guidance for Aquatic Permitting Resources* Ecology Publication # 03-06-007 http://www.ecy.wa.gov/biblio/0306007.html
25	Ecology Wetland Mitigation Banking Home Page http://www.ecy.wa.gov/programs/sea/wetmitig/index.html
25	Governor's Executive Order 89-10 (Protection of Wetlands) http://www.governor.wa.gov/eo/eoarchive/eo89-10.htm
30	Best Available Science for Freshwater Wetlands http://www.ecy.wa.gov/programs/sea/bas_wetlands/index.html
53, 59	Ecology wetland rating system(s) (currently being revised, see the Wetlands Home Page) http://www.ecy.wa.gov/programs/sea/wetlan.html
56	Chapter 2 of *Freshwater Wetlands in Washington State Volume 1: A Synthesis of the Science* http://www.ecy.wa.gov/programs/sea/bas_wetlands/vol1/chp2-new.pdf
59	*Washington State Function Assessment Methods* http://www.ecy.wa.gov/programs/sea/wfap/index.html
60	*Wetland Functions Characterization Tool for Linear Projects* http://www.wsdot.wa.gov/environment/biology/docs/bpjtool.pdf
72	*Dolan v. City of Tigard,* 512 U.S. 374, 114 S.Ct. 2309, 129 L.Ed.2d 304 (1994) http://supct.law.cornell.edu/supct/html/93-518.ZS.html
89	The Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines (1990 Corps and EPA MOA) http://www.epa.gov/OWOW/wetlands/regs/mitigate.html
91	1990 MOA (same as 19 and 89 above) http://www.epa.gov/OWOW/wetlands/regs/mitigate.html
105	Integrated Streambank Protection Guidelines http://wdfw.wa.gov/hab/ahg/ispg.pdf

OTHER ON-LINE RESOURCES

(this is a work in progress – please provide suggestions for additional on-line resources)

Publications

Corps of Engineers Wetland Delineation Manual. January 1987. On-line Edition. http://www.wes.army.mil/el/wetlands/pdfs/wlman87.pdf

Permit Handbook: Commonly Required Environmental Permits for Washington State. Ecology Publication #90-29. http://www.ecy.wa.gov/biblio/9029.html

Washington State Wetlands Identification and Delineation Manual. Ecology Publication[25] #96-94. http://www.ecy.wa.gov/biblio/9694.html

Washington State Wetland Mitigation Evaluation Study. Ecology Publication #'s 00-06-016, 02-06-009, 02-06-010. http://www.ecy.wa.gov/programs/sea/mit-study/index.html

Government Sites

Code of Federal Regulations (CFR)
http://www.gpoaccess.gov/cfr/index.html

Federal Register (FR)
http://www.gpoaccess.gov/fr/

Revised Code of Washington (RCW)
http://www.leg.wa.gov/rcw/index.cfm

The Library of Congress, THOMAS, Legislative Information on the Internet. Find recent amendments to laws by searching this web site. http://thomas.loc.gov/

Washington Administrative Codes (WAC's)
http://www.leg.wa.gov/wac/

Washington State Department of Ecology
http://www.ecy.wa.gov

United States Army Corps of Engineers – Seattle District (Regulatory)
http://www.nws.usace.army.mil/reg.html

[25] All Department of Ecology Publications are available by contacting the Publications Distributions Office at address: PO Box 47600, Olympia WA 98504-7600, email: jewi461@ecy.wa.gov, or phone: (360) 407-7472.

United States Code (USC) – Office of the Law Revision Counsel
http://uscode.house.gov/uscode.htm

United States Code (USC) – Legal Information Institute
http://www4.law.cornell.edu/uscode

United States Environmental Protection Agency Headquarters Wetlands Page
http://www.epa.gov/owow/wetlands/

Related Sites

Department of Ecology Wetlands Mitigation Banking Home Page
http://www.ecy.wa.gov/programs/sea/wetmitig/index.html

National Wetlands Mitigation Action Plan
http://www.mitigationactionplan.gov/index.html

APPENDICES

Appendix A – National Research Council's Mitigation Guidelines

Incorporating the National Research Council's Mitigation Guidelines Into the Clean Water Act Section 404 Program

BACKGROUND

In its comprehensive report entitled *"Compensating for Wetland Losses Under the Clean Water Act,"* the National Research Council (NRC) provided ten guidelines to aid in planning and implementing successful mitigation projects ("Operational Guidelines for Creating or Restoring Wetlands that are Ecologically Self-Sustaining"; NRC, 2001). Please note that these guidelines also pertain to restoration and enhancement of other aquatic resource systems, such as streams. Each of the ten guidelines can generally be described as A) basic requirement for mitigation success, or B) guide for mitigation site selection. The following sections include both the original text of the NRC guidelines, in italics, as well as a discussion of how applicants and field staff can incorporate these guidelines into the development and review of mitigation projects.

A. Basic Requirements for Success

When considering mitigation sites it is important to note that wetland mitigation is not a precise, exact science and predictable results are not always obtainable. Having an adaptive management attitude is a necessity. One should incorporate experimentation into the mitigation plan when possible. This may mean using experimental plots within a mitigation site with different controls, replication, different treatments, inputs, etc., to determine if specific mitigation efforts are effectively meeting the desired goals. This requires detailed planning, effective implementation of the mitigation project, close monitoring (both short and long term) of the implemented plans and finally adjusting to intermediate results with an adaptive attitude and additional modifications to obtain long range wetland and watershed goals. In addition, researchers have found that restoration is the most likely type of mitigation to result in successful and sustainable aquatic resource replacement. Moreover, numerous studies in a variety of landscapes and watershed types have shown that of all factors contributing to mitigation success, attaining and maintaining appropriate hydrological conditions is the most important. The following NRC guidelines should be considered basic requirements for mitigation success.

A.1. Whenever possible, choose wetland restoration over creation.

Select sites where wetlands previously existed or where nearby wetlands still exist. Restoration of wetlands has been observed to be more feasible and sustainable than creation of wetlands. In restored sites the proper substrate may be present, seed sources may be on-site or nearby, and the appropriate hydrological conditions may exist or may be more easily restored.

The U.S. Army Corps of Engineers (Corps) and Environmental Protection Agency (EPA) Mitigation Memorandum of Agreement states that, "because the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, restoration should be the first option considered" (Fed. Regist. 60(Nov. 28):58605). The Florida Department of Environmental Regulation (FDER 1991a) recommends an emphasis on restoration first, then enhancement, and, finally, creation as a last resort. Morgan and Roberts (1999) recommend encouraging the use of more restoration and less creation.

The applicant proposes the type of mitigation. However, the Corps and other agencies will evaluate proposals based on the ease of completion and the likelihood of success. Therefore, pure wetland creation will be evaluated using very stringent criteria before being approved for use as compensatory mitigation for project impacts. Some projects may include creation as part of an overall mitigation effort that involves restoration, enhancement, and/or preservation (e.g., as in a proposed mitigation bank). In these cases, evaluation will be based on the entire proposal and its location in the watershed.

A.2. **Avoid over-engineered structures in the wetland's design**

> *Design the system for minimal maintenance. Set initial conditions and let the system develop. Natural systems should be planned to accommodate biological systems. The system of plants, animals, microbes, substrate, and water flows should be developed for self-maintenance and self-design. Whenever possible, avoid manipulating wetland processes using approaches that require continual maintenance. Avoid hydraulic control structures and other engineered structures that are vulnerable to chronic failure and require maintenance and replacement. If necessary to design in structures, such as to prevent erosion until the wetland has developed soil stability, do so using natural features, such as large woody debris. Be aware that more specific habitat designs and planting will be required where rare and endangered species are among the specific restoration targets.*
>
> *Whenever feasible, use natural recruitment sources for more resilient vegetation establishment. Some systems, especially estuarine wetlands, are rapidly colonized, and natural recruitment is often equivalent or superior to plantings (Dawe et al. 2000). Try to take advantage of native seed banks, and use soil and plant material salvage whenever possible. Consider planting mature plants as supplemental rather than required, with the decision depending on early results from natural recruitment and invasive species occurrence. Evaluate on-site and nearby seed banks to ascertain their viability and response to hydrological conditions. When plant introduction is necessary to promote soil stability and prevent invasive species, the vegetation selected must be appropriate to the site rather than forced to fit external pressures for an ancillary purpose (e.g., preferred wildlife food source or habitat).*

The use of over-engineered structures and maintenance intensive plans for mitigation is not recommended and will be evaluated using very stringent criteria. If these types of plans are ultimately approved, they must include a comprehensive remedial plan and financial assurances [note that all mitigation projects should have remedial plans and financial assurances], along with a non-wasting endowment to insure that proper maintenance occurs.

It should also be noted that aggressive soil and planting plans using introduced plants and soil from outside sources must be closely monitored to prevent invasive plant takeovers and monotypic plant communities. Such failures can be minimized by undertaking both short-term and long-term monitoring, and having contingency plans in place.

A. 3. **Restore or develop naturally variable hydrological conditions**.

Promote naturally variable hydrology, with emphasis on enabling fluctuations in water flow and level, and duration and frequency of change, representative of other comparable wetlands in the same landscape setting. Preferably, natural hydrology should be allowed to become reestablished rather than finessed through active engineering devices to mimic a natural hydroperiod. When restoration is not an option, favor the use of passive devices that have a higher likelihood to sustain the desired hydroperiod over long term. Try to avoid designing a system dependent on water-control structures or other artificial infrastructure that must be maintained in perpetuity in order for wetland hydrology to meet the specified design. In situations where direct (in-kind) replacement is desired, candidate mitigation sites should have the same basic hydrological attributes as the impacted site.

Hydrology should be inspected during flood seasons and heavy rains, and the annual and extreme-event flooding histories of the site should be reviewed as closely as possible. For larger mitigation projects, a detailed hydrological study of the site should be undertaken, including a determination of the potential interaction of groundwater with the proposed wetland. Without flooding or saturated soils, for at least part of the growing season, a wetland will not develop. Similarly, a site that is too wet will not support the desired biodiversity. The tidal cycle and stages are important to the hydrology of coastal wetlands.

Natural hydrology is the most important factor in the development of successful mitigation. Wetlands and other waters are very dynamic, and dependent on natural seasonal and yearly variations that are unlikely to be sustainable in a controlled hydrologic environment. Artificial structures and mechanisms should be used only temporarily. Complex engineering and solely artificial mechanisms to maintain water flow normally will not be acceptable in a mitigation proposal. In those sites where an artificial water source (irrigation) has been used to attempt to simulate natural hydrology there are several problems that lead to reduced likelihood of success. First, artificial irrigation does not provide the dynamic and variable nature of water flow normally found in wetlands or riparian systems. Second, the lack of seasonal flows limits the transport of organic matter into and out of the wetland or riparian system. Without any inflow, the net result of artificial irrigation is transport of organic material out of the system. Third, depending on the timing, the use of flood or sprinkler systems on newly created or restoration sites often promotes the germination and growth of exotic plant species.

Note that this changes the Corps' past policy of accepting artificial irrigation as the sole source of hydrology for mitigation projects. If permitted at all, these projects will require substantial financial assurances and a higher mitigation ratio to offset their risk of failure. Applicants must weigh the potential investment costs of acquiring land suitable for restoration versus creation projects in upland environments that will likely involve higher long-term costs and greater risks of mitigation site failure.

The Corps may approve exceptions dealing with hydrologic manipulations, on a case-by-case basis in highly unusual circumstances. It should be noted, however, that even minor engineering or hydraulic manipulation requiring long-term maintenance will only be approved after the applicant posts a non-wasting endowment, performance bond, or other financial assurance.

A.4. **Consider complications associated with creation or restoration in seriously degraded or disturbed sites**

> *A seriously degraded wetland, surrounded by an extensively developed landscape, may achieve its maximal function only as an impaired system that requires active management to support natural processes and native species (NRC 1992). It should be recognized, however, that the functional performance of some degraded sites may be optimized by mitigation, and these considerations should be included if the goal of the mitigation is water- or sediment-quality improvement, promotion of rare or endangered species, or other objectives best served by locating a wetland in a disturbed landscape position. Disturbance that is intense, unnatural, or rare can promote extensive invasion by exotic species or at least delay the natural rates of redevelopment. Reintroducing natural hydrology with minimal excavation of soils often promotes alternative pathways of wetland development. It is often advantageous to preserve the integrity of native soils and to avoid deep grading of substrates that may destroy natural belowground processes and facilitate exotic species colonization (Zedler 1996).*

When considering restoration options it is necessary to determine the spatial and temporal scale of the damage: is the damage limited to the water body itself, or is it a predominant characteristic of the watershed or the surrounding landscape? On-site damage may be restorable, whereas regional-scale damage may be more difficult, or impossible, to reverse or obtain historic conditions. Alternate goals may be necessary in order to determine specific goals of the restoration project. Those desired wetland mitigation goals will depend on the resources needed, the level of degradation and realistic mitigation targets as reflected by the watershed and surrounding landscape. This issue points to the importance of evaluating mitigation plans from a broader watershed perspective.

A.5. **Conduct early monitoring as part of adaptive management**

> *Develop a thorough monitoring plan as part of an adaptive management program that provides early indication of potential problems and direction for correction actions. The monitoring of wetland structure, processes, and function from the onset of wetland restoration or creation can indicate potential problems. Process monitoring (e.g., water-level fluctuations, sediment accretion and erosion, plant flowering, and bird nesting) is particularly important because it will likely identify the source of a problem and how it can be remedied. Monitoring and control of nonindigenous species should be a part of any effective adaptive management program. Assessment of wetland performance must be integrated with adaptive management. Both require understanding the processes that drive the structure and characteristics of a developing wetland. Simply documenting the structure (vegetation, sediments, fauna, and nutrients) will not provide the knowledge and guidance required to make adaptive "corrections" when adverse conditions are discovered. Although wetland development may take years to decades, process-based monitoring might provide more sensitive early indicators of whether a mitigation site is proceeding along an appropriate trajectory.*

There are many factors that may positively or negatively influence aquatic resources and the functions they provide, such as urbanization, farming or grazing. Wetlands and other aquatic resources are often subject to a wide range and frequency of events such as floods, fires and ice storms. As with all natural systems, some things are beyond control. Well-crafted mitigation plans, however, recognize the

likelihood of these events and attempt to plan for them, primarily through monitoring and adaptive management. In addition, it is important to realize the mobile nature of wetlands and streams. They change over time and over the landscape in response to internal and external forces.

Monitoring and adaptive management should be used to evaluate and adjust maintenance (e.g., predator control, irrigation), and design remedial actions. Adaptive management should consider changes in ecological patterns and processes, including biodiversity of the mitigation project as it evolves or goes through successional stages. Trends in the surrounding area must also be taken into account (i.e., landscape/watershed context). Being proactive helps ensure the ultimate success of the mitigation, and improvement of the greater landscape. One proactive methodology is incorporation of experimentation into the mitigation plan when possible, such as using experimental plots within a mitigation site with different controls, replication, different treatments, inputs, etc., to determine if specific mitigation efforts are meeting the desired goals.

B. **Mitigation Site Selection**

The selection of an appropriate site to construct a mitigation project is one of the most important, yet often under-evaluated, aspects of mitigation planning. In many instances, the choice of the mitigation site has been completed by the applicant based solely on economic considerations with minimal concern for the underlying physical and ecological characteristics of the site. While economic factors are important in determining the practicability of site selection, current technology and the following NRC guidelines should also factor into the selection of a mitigation site.

B.1. **Consider the hydrogeomorphic and ecological landscape and climate**

Whenever possible, locate the mitigation site in a setting of comparable landscape position and hydrogeomorphic class. Do not generate atypical "hydrogeomorphic hybrids"; instead, duplicate the features of reference wetlands or enhance connectivity with natural upland landscape elements (Gwin et al. 1999).

Regulatory agency personnel should provide a landscape setting characterization of both the wetland to be developed and, using comparable descriptors, the proposed mitigation site. Consider conducting a cumulative impact analysis at the landscape level based on templates for wetland development (Bedford 1999). Landscapes have natural patterns that maximize the value and function of individual habitats. For example, isolated wetlands function in ways that are quite different from wetlands adjacent to rivers. A forested wetland island, created in an otherwise grassy or agricultural landscape, will support species that are different from those in a forested wetland in a large forest tract. For wildlife and fisheries enhancement, determine if the wetland site is along ecological corridors such as migratory flyways or spawning runs. Constraints also include landscape factors. Shoreline and coastal wetlands adjacent to heavy wave action have historically high erosion rates or highly erodible soils, and often-heavy boat wakes. Placement of wetlands in these locations may require shoreline armoring and other protective engineered structures that are contrary to the mitigation goals and at cross-purposes to the desired functions

Even though catastrophic events cannot be prevented, a fundamental factor in mitigation plan design should be how well the site will respond to natural disturbances that are likely to occur. Floods, droughts, muskrats, geese, and storms are expected natural disturbances and should be accommodated in mitigation designs rather than feared. Natural ecosystems generally recover rapidly from natural disturbances to which they are adapted. The design should aim to restore a series of natural processes at the mitigation sites to ensure that resilience will have been achieved.

Watershed management requires thinking in terms of multiple spatial scales: the specific wetland or stream itself, the watershed that influences the wetland/stream, and the greater landscape. The landscape in which a wetland or water exists, defines its hydrogeologic setting. The hydrogeologic setting in turn controls surface and sub-surface flows of water, while a variety of hydrogeologic settings results in biological and functional diversity of aquatic resources.

There are three aspects of watershed management that the applicant must address in a mitigation plan: hydrogeomorphic considerations, the ecological landscape, and climate. It should be noted that the overall goal of compensatory mitigation is to replace the functions being lost (functional equivalency) due to a permitted Section 404 activity. By evaluating the hydrogeomorphic setting, ecological landscape and climate, one can determine which attributes can be manipulated (i.e. hydrology, topography, soil, vegetation or fauna) to restore, create or enhance viable aquatic functions.

Hydrogeomorphic considerations refers to the source of water and the geomorphic setting of the area. For example, a riverine wetland receives water from upstream sources in a linear manner, whereas vernal pools exist as relatively closed depressions underlain by an impermeable layer that allows rainfall runoff from a small watershed to fill the pool during specific times of year. Applicants should strive to replicate the hydrogeomorphic regime of the impacted water to increase the potential that the mitigation site mimics the functions lost. Only as a last resort, should applicants prepare plans for constructing wetlands using artificial water sources or placing wetlands into non-appropriate areas of the landscape. In such cases, there should be a contingency plan to prepare for unanticipated events or failures.

Ecological landscape describes the location and setting of the wetland/water in the surrounding landscape. For example, attempting to place mitigation in a dissimilar ecological complex than that of the impacted water is expected to result in a wetland/water unlikely to replicate the functions of the wetland/water that was lost. In all cases, the applicant should evaluate the historical ecological landscape of the mitigation site; for example, if there had been large areas of forested wetland in an agricultural area, then replacement of a forested wetland may be appropriate given other factors that should be considered. In most cases, applicants should plan for a mitigation area that fits best within the ecological landscape of the watershed or region of the mitigation site. Applicants should also consider constructing mitigation sites with more than one type of wetland/water regime, if appropriate, to provide for landscape diversity.

Climate also affects mitigation and is clearly beyond the control of the applicant. Therefore, the mitigation site should be sited in an area supported by the normal rainfall, subsurface and/or groundwater in the region. Climate considerations also can impact other hydrologic issues, sediment transport factors and other factors affecting attainment of desired functions. While climate cannot be manipulated, applicants need to account for it in mitigation plans, including local and regional variability and extremes.

B. 2. **Adopt a dynamic landscape perspective**

> *Consider both current and future watershed hydrology and wetland location. Take into account surrounding land use and future plans for the land. Select sites that are, and will continue to be, resistant to disturbance from the surrounding landscape, such as preserving large buffers and connectivity to other wetlands. Build on existing wetland and upland systems. If possible, locate the mitigation site to take advantage of refuges, buffers, green spaces, and other preserved elements of the landscape. Design a system that utilizes natural processes and energies, such as the potential energy of streams as natural subsidies to the system. Flooding rivers and tides transport great quantities of water, nutrients, and organic matter in relatively short time periods, subsidizing the wetlands open to these flows as well as the adjacent rivers, lakes, and estuaries.*

Applicants should consider both current and expected future hydrology (including effects of any proposed manipulations), sediment transport, locations of water resources, and overall watershed functional goals before choosing a mitigation site. This is extremely critical in watersheds that are rapidly urbanizing; changing infiltration rates can modify runoff profiles substantially, with associated changes in sediment transport, flooding frequency, and water quality. More importantly, this factor encourages applicants to plan for long-term survival by placing mitigation in areas that will remain as open space and not be severely impacted by clearly predictable development. Consideration of the landscape perspective requires evaluation of buffers and connectivity (both hydrologic- and habitat-related). Buffers are particularly important to insure that changing conditions are ameliorated, especially in watersheds that have been, or are in the process of being, heavily developed. In addition, because wetlands are so dynamic, adequate buffers and open space upland areas are vital to allowing for wetlands to "breath" (expand and/or decrease in size and function) and migrate within the landscape, particularly in watersheds under natural and/or man-made pressures.

B.3. **Pay attention to subsurface conditions, including soil and sediment geochemistry and physics, groundwater quantity and quality, and infaunal communities**.

> *Inspect and characterize the soils in some detail to determine their permeability, texture, and stratigraphy. Highly permeable soils are not likely to support a wetland unless water inflow rates or water tables are high. Characterize the general chemical structure and variability of soils, surface water, groundwater, and tides. Even if the wetland is being created or restored primarily for wildlife enhancement, chemicals in the soil and water may be significant, either for wetland productivity or bioaccumulation of toxic materials. At a minimum, these should include chemical attributes that control critical geochemical or biological processes, such as pH, redox, nutrients (nitrogen and phosphorus species), organic content and suspended matter.*

Knowledge of the physical and chemical properties of the soil and water at the mitigation site is also critical to choice of location. For example, to mitigate for a saline wetland, without knowing the properties of the soil and water sources at the mitigation site, it is unlikely that such a wetland is restorable or creatable. Certain plants are capable of tolerating some chemicals and actually thrive in those environments, while others plants have low tolerances and quickly diminish when subjected to water containing certain chemicals, promoting monotypic plant communities. Planning for outside

influences that may negatively affect the mitigation project can make a big difference as to the success of the mitigation efforts and meeting watershed objectives.

B.4 **Pay particular attention to appropriate planting elevation, depth, soil type, and seasonal timing**

> *When the introduction of species is necessary, select appropriate genotypes. Genetic differences within species can affect wetland restoration outcomes, as found by Seliskar (1995), who planted cordgrass (Spartina alterniflora) from Georgia, Delaware, and Massachusetts into a tidal wetland restoration site in Delaware. Different genotypes displayed differences in stem density, stem height, belowground biomass, rooting depth, decomposition rate, and carbohydrate allocation. Beneath the plantings, there were differences in edaphic chlorophyll and invertebrates.*
>
> *Many sites are deemed compliant once the vegetation community becomes established. If a site is still being irrigated or recently stopped being irrigated, the vegetation might not survive. In other cases, plants that are dependent on surface-water input might not have developed deep root systems. When the surface-water input is stopped, the plants decline and eventually die, leaving the mitigation site in poor condition after the Corps has certified the project as compliant.*

A successful mitigation plan needs to consider soil type and source, base elevation and water depth, plant adaptability and tolerances, and the timing of water input. When possible: a) use local plant stock already genetically adapted to the local environment; b) use stock known to be generally free from invasive or non-native species; c) use soil banks predetermined to have desirable seed sources; d) choose soil with desirable characteristics (e.g., high clay composition and low silt and sand

composition for compaction purposes); e) determine \final bottom elevations to insure that targeted water regimes are met and the planned plant community can tolerate the water depth, frequency of inundation and quality of water sources.

It is particularly helpful to examine reference wetlands and/or waters near the mitigation area, in order to identify typical characteristics of sustainable waters in a particular watershed or region. This allows one to determine the likelihood of certain attributes developing in a proposed mitigation site. It should be emphasized that wetland restoration is much more likely to achieve desired results than wetland creation, as evidence of a previously existing wetland or other aquatic resource is a strong indicator of what will return, given the proper circumstances Historical data for a particular site, if available, can also help establish management goals and monitoring objectives. Creating wetlands from uplands has proven to be difficult and often requires extensive maintenance.

B.5. **Provide appropriately heterogeneous topography**

> *The need to promote specific hydroperiods to support specific wetland plants and animals means that appropriate elevations and topographic variations must be present in restoration and creation sites. Slight differences in topography (e.g., micro- and meso-scale variations and presence and absence of drainage connections) can alter the timing, frequency, amplitude, and duration of inundation. In the case of some less-studied, restored wetland types, there is little scientific or technical information on natural microtopography (e.g., what causes strings*

and flarks in patterned fens or how hummocks in fens control local nutrient dynamics and species assemblages and subsurface hydrology are poorly known). In all cases, but especially those with minimal scientific and technical background, the proposed development wetland or appropriate example(s) of the target wetland type should provide a model template for incorporating microtopography.

Plan for elevations that are appropriate to plant and animal communities that are reflected in adjacent or close-by natural systems. In tidal systems, be aware of local variations in tidal flooding regime (e.g., due to freshwater flow and local controls on circulation) that might affect flooding duration and frequency.

While manipulations of natural water supply may not be possible or desirable, changes in topography are possible and should be incorporated in the design of a restored or created wetland/water when needed. Varying the depths of the substrate of the mitigation area ensures a heterogeneous topography, decreasing the likelihood of homogenous plant communities. Rather than plan on one water level or one elevation of the substrate, in hopes of establishing a specific plant community, it is best to vary the depth of the bottom stratum. This will increase the likelihood of success for a more diverse targeted plant community and desired functions.

Appendix B – Agency Contacts

US Army Corps of Engineers

The Seattle District administers the Corps' permit program throughout the state of Washington. An exception is Port activities on the Washington side of the Lower Columbia River, which are processed by the Portland District. In addition, the boundaries of the Walla Walla District extend in to WA (the watershed of the Snake River, and a portion of the Columbia River Drainage between the Umatilla Bridge just below McNary Dam (River Mile 290.5) and the end of the Lake Wallula backwater that forms behind McNary Dam (River Mile 345.4), with the exception of the Yakima River Basin beyond River Mile 8.5 near Richland, Washington).

Seattle District Headquarters

Check the following website for the most current list of regulatory contacts:
http://www.nws.usace.army.mil/reg.html (Regulatory)

Mailing Address:
Seattle District Corps of Engineers
Regulatory Branch, CENWS-OD-RG
ATTN: "person's name, if applicable"
Post Office Box 3755
Seattle, Washington 98124-3755

Physical Address:
Federal Center South
4735 E. Marginal Way South
Seattle, Washington

Telephone: (206) 764-3495
Fax: (206) 764-6602

Seattle District Regional Contacts

SOUTHWEST WASHINGTON FIELD OFFICE

U.S. Army Corps of Engineers Southwest Washington Field Office 2108 Grand Boulevard Vancouver, WA 98661-4624 Fax: (360) 750-9307	***Clark, Klickitat, Skamania (south of Swift Reservoir)***	Ron Klump (360)750-9046
	Cowlitz, Wahkiakum, Skamania (Swift Reservoir and north)	David Martin (360)694-1171

CENTRALWASHINGTON FIELD OFFICE

Chelan, Douglas, Grant and Okanogan

Debbie Knaub
U.S. Army Corps of Engineers
Central Washington Field Office
Post Office Box 2829
Chelan, Washington 98816
Telephone: (509) 682-7010
Fax: (509) 682-7710

Kittitas and Yakima

Joe Brock
Seattle District Corps of Engineers
Regulatory Branch, CENWS-OD-RG
ATTN: Joe Brock
Post Office Box 3755
Seattle, Washington 98124
Telephone: (206) 764-6905
Fax: (206) 764-6602

EASTERN WASHINGTIN FIELD OFFICE

Adams, Asotin, Benton, Columbia, Ferry, Franklin, Garfield, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman

U.S. Army Corps of Engineers — Tim Erkel (509) 238-4570
Eastern Washington Field Office
Post Office Box 273
Chattaroy, Washington 99003-0273
Fax: (509)238-4561

US Environmental Protection Agency (Region 10)

The main regional EPA function is to provide oversight of Corps projects statewide, and to write 401 certifications and provide assistance on tribal lands and national parks. Within EPA, staff responsibility is generally divided up by county, but the county responsibilities sometimes shift. For on the ground or project-specific information contact the Regional Office at 206-553-1200 or 1-800-424-4EPA(toll free number).

The following is a list of staff that can all answer questions regarding mitigation proposals:

Joan Cabreza (mitigation, mitigation banking, invasive species, 401 certifications)
Telephone: (206)553-7369

Dick Clark (regulatory/permit processes, 401 certifications)
Telephone: (206)553-6522

Krista Rave-Perlins (401 certifications)
Telephone: (206)553-6686

Ralph Rogers (regional ecologist, mitigation/restoration)
Telephone: (206)553-4012

Wetlands Helpline
For more general wetlands information you can contact the EPA Wetlands Helpline. The helpline is a national resource and may be useful for obtaining national publications, federal registers, general wetland information, etc.

Who We Are
The EPA Wetlands Helpline is a contractor-operated information and referral service which handles requests for information on wetlands regulation, legislation and policy pursuant to Section 404 of the Clean Water Act, wetlands values and functions, and wetlands agricultural issues. The Helpline acts as a first point of contact for EPA's Wetlands Division, which is part of the Office of Wetlands, Oceans and Watersheds (OWOW). As of January 1, 2002, the Helpline has been co-located within the EPA's Water Resource Center allowing both Helpline and Resource Center customers access to the full spectrum of water-related public information available from EPA.

What We Do
The Helpline is staffed by librarians providing in-depth, EPA-approved information, documents, and referrals addressing Federal and State regulatory programs, wetlands science, and educational outreach. Librarians can respond to specialized research requests using the Helpline's extensive reference library, as well as other pertinent sources including the Internet. Librarians also maintain an extensive list of contacts at regulatory agencies and other organizations to provide the most appropriate and accurate referrals.

Our Documents

The Helpline maintains a catalog of documents which can be ordered either over the phone, by E-mail or FAX, or through the Office of Water's new "Shopping Cart" online Publications Ordering System. Documents available from the Helpline will be mailed to requestors free-of-charge. An EPA Wetlands Helpline Publication List containing more than 125 publications is also available to callers upon request.

The Helpline frequently adds new documents to its inventory, including emergent regulatory guidance, technical documents, and other specialized wetlands publications. Each mail order request will include an updated publication list.

Contact Us

Hours: Monday through Friday, excluding Federal Holidays, 8:30am to 5:30pm Eastern Standard Time. Voice mail available after business hours.

Telephone: (toll free U.S.) 1-800-832-7828. International callers: (202) 566-1730.

FAX: (202) 566-1736.

E-Mail: wetlands.helpline@epa.gov. You may also use the Water Resource Center's E-Mail Form to contact us - just include the words "ATTN WETLANDS" in your message.

Website: http://www.epa.gov/OWOW/wetlands/wetline.html

Directions: Open to the public by appointment only. Call us.

Helpline Publications List: http://www.epa.gov/owow/wetlands/wetpubs.html

Mailing Address:
Wetlands Helpline
c/o EPA Water Resource Center
Mail Code RC-4100T
1200 Pennsylvania Ave NW
Washington, DC 20460
Physical Address for FedEx/UPS shipments:
Wetlands Helpline
c/o EPA Water Resource Center
1301 Constitution Ave. NW
EPA West, Room 1119
Washington DC 20460

Washington State Department of Ecology

HEADQUARTERS PO Box 47600 Olympia, WA 98504 Fax: (360) 407-6902	***Policy & Regulation***	Andy McMillan (360) 407-7272	***Restoration(@NWRO)***	Stephen Stanley (425) 649-4210
	Senior Ecologist	Tom Hruby (360) 407-7274	***GIS***	Susan Grigsby (360) 407-7546
	Stewardship	Jane Rubey (360) 407-7258	***Mitigation Guidance Project***	Dana L. Mock (360) 407-6947 Lauren Driscoll (360)407-6861
	Best Available Science Project	Teri Granger (360) 407-6857		Patricia Johnson (360) 407-6140
			Isolated Wetlands	(800) 917-0043

Regional Contacts

EASTERN REGION
N. 4601 Monroe
Spokane, WA 99205-1295
Fax: (509) 329-3529

Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman

Chris Merker (509) 329-3528

CENTRAL REGION
15 West Yakima Avenue, Suite 200
Yakima, WA 98902-3401
FAX: (509) 575-2809

Benton, Kittitas, Klickitat, Yakima — Cathy Reed (509) 575-2616

Chelan, Douglas, Okanogan — Mark Schuppe (509) 575-2384

SOUTHWEST REGION
PO Box 47775
Olympia, WA 98504-7775
FAX: (360) 407-6305

Clallam, Jefferson, Pierce, Mason Thurston — Ann Boeholt (360) 407-6221

Grays Harbor, Pacific — Perry Lund (360) 407-7260

Wahkiakum, Skamania, Clark Cowlitz, Lewis — Brad Murphy (360) 407-7273

NORTHWEST REGION Mail Stop NB-81 3190 - 160th Avenue SE Bellevue, WA 98008-5452 FAX: (206) 649-7098	***Snohomish, King, Kitsap, San Juan***	Sarah Suggs (425) 649-7124
	Whatcom, Skagit, Island	Susan Meyer (425) 649-7168
	***Watershed Planning & Technical Assistance***	Erik Stockdale (425) 649-7061

Office of Regulatory Assistance (ORA)

Help with Environmental Permitting

Staff provide information regarding environmental permits issued by the State departments of Ecology, Fish and Wildlife, Health, and Natural Resources, and the local air authorities. Regional staff are available to coordinate permit applications for large, complex projects, and to work with applicants, agencies and regulatory authorities to develop a plan for meeting environmental and land-use requirements.

The Office is located in the Ecology Building at 300 Desmond Dr. SE, Lacey, WA. Staff are available Monday, Tuesday and Thursday from 9 a.m. to 4 p.m. Although you can drop in anytime during those hours, it is recommended that you make an appointment. You can call the Office at **360-407-7037** or **800-917-0043**, or e-mail us at **ecypac@ecy.wa.gov** or go to the website at http://www.ecy.wa.gov/programs/sea/pac/.

Local Government Contacts

Most local governments (cites and counties) maintain web sites with current contact information. The Municipal Research & Services Center of Washington maintains a current list of local government web sites (for cities and towns go to http://www.mrsc.org/byndmrsc/cities.aspx and for counties go to http://www.mrsc.org/byndmrsc/counties.aspx). This information is also accessible on the Access Washington web site, which provides Washington State Government information and services http://access.wa.gov/).

You can call the Municipal Research & Services Center of Washington to get the phone number for your local government planner at (206) 625-1300.

Appendix C - Hiring a Qualified Wetlands Specialist

Who needs a qualified wetlands specialist?

Qualified wetlands specialists are usually hired as consultants to identify and delineate wetlands, assess the functions and values of a particular wetland, provide assistance with wetland regulations and permits, often including completion of necessary application forms, and providing advice about designing wetland compensatory mitigation projects. They are generally hired by landowners or developers who want to do something on their property that may affect a wetland. Many local governments hire consultants to provide third-party review services. Some consultants are self-employed; others work for larger environmental consulting firms. The recommendations included here are intended to assist you in locating consultants who can help you with wetland issues.

What is a qualified wetlands specialist?

There is no government sanctioned program for certifying someone as a "qualified wetland specialist". Generally, the term means a person with professional experience and comprehensive training in wetlands issues, including experience performing wetland delineations, assessing wetland functions and values, analyzing wetland impacts, and recommending and designing wetland mitigation projects.

The Society of Wetland Scientists (SWS) administers a professional certification program for wetland scientists and has two levels of certification: Professional Wetland Scientist (PWS) and Wetland Professional In-Training (WPIT). A person certified as a PWS would be considered a qualified wetlands specialist (see below for description).

If the person is not a certified PWS, there is not simple measure of determining qualification. However, the following criteria are indicators of someone who may be qualified to perform the wide range of tasks typically required of a wetlands specialist:

- At a minimum, a Bachelor of Science or Bachelor of Arts or equivalent degree in hydrology, soil science, botany, ecology, or related field. A graduate degree in one of these fields is an indication of more advanced expertise;
- At least two years of full-time work experience as a wetlands professional including delineating wetlands using the state or federal manuals, preparing wetland reports, conducting function assessments, and developing and implementing mitigation plans. Generally, the more years of experience the greater the expertise;
- Completion of additional wetland-specific training programs. This could include a more comprehensive program such as the University of Washington Wetland Certificate Program, or individual workshops on wetland delineation, function assessment, mitigation design, hydrophytic plant or hydric soil identification, etc.

Keep in mind that most people engaged in wetlands professional work have greater expertise in some aspects of the field than others. A person may have in-depth training in plant ecology or soils or hydrology but few people have all three. A person may have extensive experience in wetland delineation or function assessment and have little experience in designing and implementing mitigation projects. **Thus, it is important to be clear on what specific tasks you need completed and make sure the person or firm you hire has the specific expertise you need.** Generally, more complex projects require multiple individuals with the collective expertise to address all aspects of the project.

How to find a wetlands consultant

There are a number of ways to find the names of wetlands consultants. Finding a qualified consultant can be difficult since "wetland consultants" are not required to be certified, licensed, or bonded. One approach

is to look in the Yellow Pages of your phone directory (or the directories of the closest cities) under "Environmental and Ecological Services." You can also contact your local government planning office and ask if they know of any local wetlands consultants. Some local governments maintain lists of wetland professionals they consider to be well qualified. Consultants may also be found by requesting the advice of associations or businesses that commonly encounter wetlands in their work, such as the Building Industry Association and Association of Washington Business. Finally, you can contact state and federal resource agencies and ask for referrals. Be aware, however, that most agencies will not be able to provide recommendations because of questions of fairness.

Selecting a wetlands consultant

There are a number of factors you should consider before hiring a wetlands consultant. When interviewing consultants, you should carefully evaluate their qualifications (see above for the minimum recommended). Be sure to ask the following questions before making your selection.

Training - Does the consultant have training or experience in the use of the 1987 federal or 1997 state wetlands delineation manuals? The consultant you select should have the ability to apply wetland identification methods used by state and federal agencies. Make sure that the consultant can identify wetlands and their boundaries consistent with regulating agencies.

Has the consultant had additional training or expertise in related fields such as hydrology, soil science, botany, or ecology?

Is the consultant knowledgeable/familiar with local, state, and federal wetland regulations?

Experience - How long has the consultant been doing wetlands work? How much experience do they have delineating wetlands in the field, assessing wetlands functions and values, or working with wetland regulations? Has the consultant worked in the part of the state where you propose to develop? Ask the consultant for examples of previous work similar to the services you are requesting. Can the consultant take you to a successful wetland mitigation project they designed and/or implemented?

Ask the consultant to describe their working relationship with the agencies that will be reviewing and/or permitting your project.

Given the complexity of some projects it is expected that a wetland consultant will team with others with experience in related fields such as water quality, wildlife, stormwater management, and hydrogeology. Ask the consultant for a list of people they have teamed with in the past.

References - Who were some of the consultant's past clients? Were they satisfied customers? Call them and find out who they worked with from the consulting firm and how they liked working with them. Ask whether there were any problems that occurred during or after the project, how the consultant handled those problems, and what they charged for their work. You may also want to find out what type of track record the company has with local, state, and federal agencies.

Request references that include clients who have had projects reviewed and approved by the regulatory agencies (Corps, Ecology, and Local government).

It never hurts to ask others. Ask colleagues and other businesses, such as real estate, development, homebuilding, etc. that are routinely involved in wetland concerns. Ask them about their experiences and knowledge regarding the consultant you are considering.

Make sure you check all references.

Staff - Who will be working on your project? Will it be the principal consultant with the years of experience or someone with less experience who works for them? Know who you're hiring!

Cost - How much will the consultant cost? Compare rates, but don't let cost be your sole criteria. Be sure to consider training, experience, and the other factors as well. A good consultant who charges you more may end up saving you money by reducing permit-processing delays.

Society of Wetland Scientists Professional Certification Program
Another option is to check to see if the person you are considering hiring is a **Certified Professional Wetland Scientist.** You can go to http://www.wetlandcert.org/ and search by the persons name, city, and/or state.

As explained in the *Professional Wetland Scientist Program Overview*:

> Certification is not required by any agency and has no official or legal standing. However, certification signifies that the academic and work experience of a Professional Wetland Scientist (PWS) meets the standards expected by his or her peers of a practicing wetland professional and provides acknowledgment to his or her peers of adherence to standards of professional ethics with regard to the conduct and practice of wetland science.
>
> Wetland Professional in Training (WPIT) is considered a preliminary step for persons who meet the requirements for either (but not both) education and experience. Professional Wetland Scientist (PWS) certification is awarded for those meeting both educational and experience requirements.
>
> Minimum degree requirements for WPIT and PWS are the BA or BS degrees, with course distribution of 15 semester hours each in biological and physical sciences and 6 hours in quantitative areas. For certification as a PWS, an additional 15 semester hours in wetland-related courses are required. In addition to comprehensive training in wetland science, a PWS is expected to have professional experience of at least 5 years as a wetland scientist, demonstrating the application of current technical knowledge dealing with wetland resources and activities.

Appendix D – Focus Sheets

Focus

Isolated Wetlands – Changes in the Regulatory Process

Supreme Court Decision

A U.S. Supreme Court decision last January regarding how wetlands are regulated has generated a lot of questions by landowners and developers.

The court ruled that the federal Clean Water Act does not apply to those "isolated" wetlands where the only interstate commerce connection is use by migratory birds. This ruling overturned 15 years of regulation of isolated wetlands by the U.S. Army Corps of Engineers. While the court did not define the term "isolated," the Corps has previously considered isolated wetlands to be those that are not adjacent to or connected via surface water to a navigable water body, such as a river, lake or marine waters.

Changes in Regulatory Process

Based on the Supreme Court's ruling, federal agencies no longer have regulatory oversight of these important environmental resources. More specifically, landowners no longer need a permit from the U.S. Army Corps of Engineers to fill in most isolated wetlands - although a Corps permit is still required for isolated wetlands with other interstate commerce use (recreation, industrial, etc.) as well as wetlands that are connected to a navigable water body.

However, the Supreme Court ruling did not change Washington state laws on wetlands. The state Clean Water Act (90.48 RCW) makes no distinction between types of wetlands. Rather, all "waters of the state" are covered by the law, and isolated wetlands are considered waters of the state.

It's not always easy to tell if a wetland is isolated. Landowners who want to develop an isolated wetland should contact the Corps of Engineers and request a formal jurisdictional determination to avoid any future legal problems and fines.

Why Regulate Isolated Wetlands?

Isolated wetlands in Washington perform many of the same important environmental functions as other wetlands, including recharging streams and aquifers, storing flood waters, filtering pollutants from water, and providing habitat for a host of plants and animals. Many wildlife species, including amphibians and waterfowl, are particularly dependent on isolated wetlands for breeding and foraging.

State Process

❖Any project that calls for filling or altering a wetland determined by the Corps to be isolated will still be subject to regulation by the state. The state's process for reviewing projects that involve isolated wetlands will be different from the 401 Water Quality Certification process that is triggered by the Corps' 404 permit. Rather, Ecology will use administrative orders to regulate projects that will have impacts to isolated wetlands. The standards of review will remain the same as under 401 water-quality certifications - that is, the state water-quality standards for surface waters (WAC 173-201A). Anyone who wants more information about the review standards should obtain the following two publications: Water Quality Guidelines for Wetlands, Publication # 96-06; and How Ecology Regulates Wetlands, Publication # 97-112. These can be obtained by contacting Jean Witt at 360-407-7472 or jewi461@ecy.wa.gov.

To seek an administrative order for a project that involves isolated wetlands, landowners should contact the Permit Assistance Center at the Department of Ecology, where our staff will guide you through the regulatory process. The phone number is 800-917-0043 or 360-407-7037, and the e-mail address is ecypac@ecy.wa.gov.

GMA Regulations

Additionally, applicants should be aware that isolated wetlands in Washington also are regulated under the state's Growth Management Act. Thus, projects with impacts to isolated wetlands typically will require approval from the applicable city or county.

Focus on

Prior Converted Croplands/Wetlands – Clarifying State Authority and the Regulatory Process

What are prior converted croplands?

Prior converted croplands (PCCs) are defined in federal law as wetlands that were drained, dredged, filled, leveled or otherwise manipulated, including the removal of woody vegetation, before December 23, 1985, to enable production of an agricultural commodity, and that: 1) have had an agricultural commodity planted or produced at least once prior to December 23, 1985; 2) do not have standing water for more than 14 consecutive days during the growing season, and 3) have not since been abandoned. Activities in prior converted croplands are not regulated under Swampbuster provisions of the federal Farm Bill or §404 of the federal Clean Water Act. However, many of the PCCs are still wetlands (i.e., they still meet the three criteria for hydrology, soils and vegetation).

The state Water Pollution Control Act (90.48 RCW) does not distinguish prior converted croplands from other wetlands. Rather, all "waters of the state" are covered by the law, and PCCs that are still wetlands are considered waters of the state. Likewise, the state Shoreline Management Act and Growth Management Act definitions of wetlands include PCCs, as long as they meet the three criteria in the state Wetland Identification and Delineation Manual.

Why regulate PCC wetlands?

The original assumption behind exempting PCC wetlands from federal regulation was the belief that these wetlands had been so altered they no longer provided important wetland functions. However, PCC wetlands in Washington perform many of the same important environmental functions as other wetlands, including recharging streams and aquifers, storing flood waters, filtering pollutants from water and providing wildlife habitat. In some cases, PCC wetlands have been significantly altered so they provide only minimal functions. However, in many cases, PCC wetlands provide important hydrologic functions and may provide significant wildlife habitat. For example, in Western Washington, many PCC wetlands have standing water during the winter, when over-wintering waterfowl are highly dependent upon flooded agricultural fields for resting and feeding areas.

State process

- Any project other than existing, ongoing agricultural activities that calls for filling or altering a wetland determined by the U.S. Corps of Engineers to be PCC is subject to regulation by the state. The state's process for reviewing projects that involve PCC wetlands is different from the 401 Water Quality Certification process that is triggered by the Corps' 404 permit. Rather, Ecology uses administrative orders to regulate projects that will affect PCC wetlands. The

standards of review are the same as those under 401 water-quality certifications - i.e., the state water-quality standards for surface waters (WAC 173-201A). Ecology recognizes that many PCC wetlands have been significantly degraded and will regulate them according to the functions they provide. Anyone who would like more information about the review standards should obtain the following two publications: Water Quality Guidelines for Wetlands, Publication # 96-06, and How Ecology Regulates Wetlands, Publication # 97-112. These can be obtained by contacting Jean Witt at 360-407-7472 or jewi461@ecy.wa.gov. To seek an administrative order for a project that involves PCC wetlands, landowners should contact the appropriate regional office of the Department of Ecology, where our staff will guide you through the regulatory process.

Northwest Regional Office
(Island, King, Kitsap, San Juan, Skagit, Snohomish, and Whatcom counties)
Address: 3190 - 160th Ave. SE, Bellevue, WA 98008-5452
Information & Receptionist: 425-649-7000
TTY for Hearing Impaired: 711 or 1-800-833-6388

Southwest Regional Office
(Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, and Wahkiakum counties)
Mailing Address: PO Box 47775, Olympia, WA 98504-7775
Physical Address: 300 Desmond Drive, Lacey, WA 98503
Information & Receptionist: 360-407-6300
TTY for Hearing Impaired: 711 or 1-800-833-6388

Central Regional Office
(Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, and Yakima counties)
Address: 15 West Yakima Ave -- Suite 200, Yakima, WA 98902-3452
Information and Receptionist: 509-575-2490
TTY for Hearing Impaired: 711 or 1-800-833-6388

Eastern Regional Office
(Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman counties)
Address: N. 4601 Monroe, Spokane, WA 99205-1295
Information and Receptionist: 509-329-3400
TTY for Hearing Impaired: 711 or 1-800-833-6388

All publications are available from the Ecology Publications Office at 360-407-7472 or are available on Ecology's homepage at http://www.ecy.wa.gov

If you require this publication in an alternate format, please contact Ecology's SEA Program at 360-407-6096, or TTY (for the speech or hearing impaired) 711 or 800-833-6388.