Chapter 8

Prescribing Solutions: Regulatory Tools

8.1 Introduction

This chapter describes the regulatory tools that can be used to protect and manage wetlands. It is intended to assist local governments in developing these tools. As with plans and policies described in Chapters 6 and 7, developing regulations is an important part of Step 2, Prescribing Solutions, in the four-step framework in a program to protect wetlands (Figure 8-1).

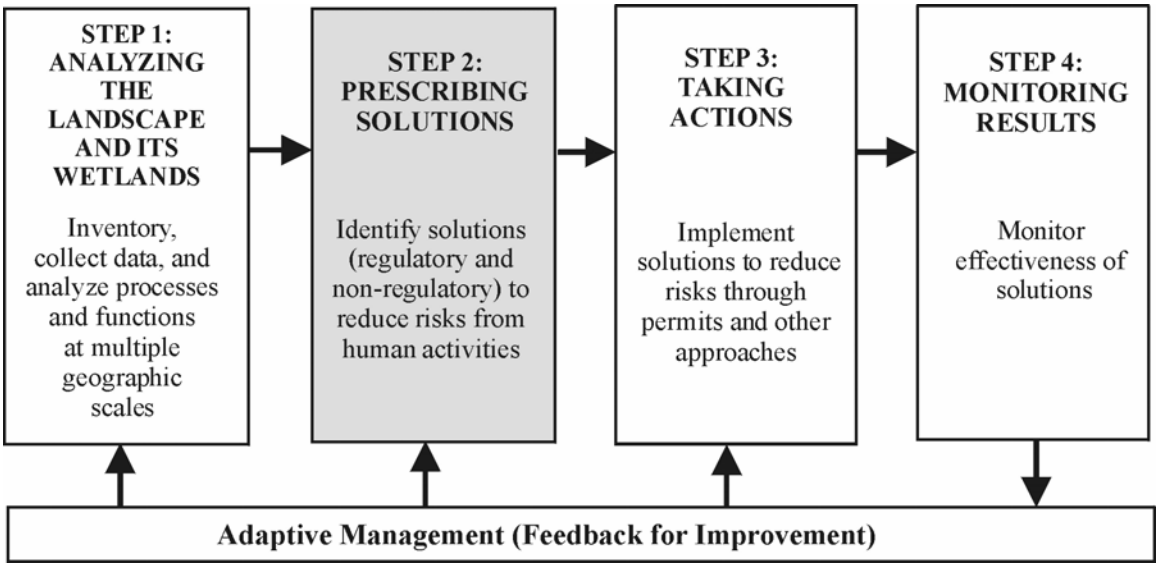

Figure 8-1. Developing regulations is part of Step 2 in the four-step framework discussed in this volume (shaded box).

Although, regulatory tools are only one part of the package of solutions recommended to protect wetland functions and values from future human impacts, they are usually the "backbone" of any wetland protection program implemented by local government.

As described in Chapter 2, the Washington State Growth Management Act (GMA) specifically requires that local governments adopt development regulations that include the best available science to protect the functions and values of critical areas (RCW 36.70A.172). These regulations are one of the primary means of implementing the goals and policies in the land-use plans of local governments.

Historically, most local governments have relied upon regulation as the sole means of protecting wetlands. A regulatory permitting component can, in fact, be very effective at limiting some of the adverse impacts associated with new development (if based on an

understanding of the scientific literature in Volume 1). However, the synthesis of the science makes it clear that reliance upon a regulatory approach using case-by-case decision-making at the site scale as the sole means of protecting wetlands will result in loss of wetland functions. Wetland regulations are most effective in preventing direct physical loss of wetland area and functions resulting from a change in land use, but regulations that focus on the site scale are not effective in addressing the indirect and cumulative impacts from larger-scale changes in landscape processes.

Using the information generated by landscape analysis described in previous chapters can help in developing regulations that protect not only the functions of individual wetlands, but protect some landscape processes as well. Although beneficial at larger scales, this is best done at a sub-basin or subarea scale, where specific regulations can be developed to prevent degradation of landscape processes and to target protection of connected habitats.

Section 8.2 of this chapter discusses several factors that should be considered when establishing regulations, such as balancing predictability with flexibility, the expertise of in-house staff to review wetland reports and permits, the assessment of risk, and the use of a separate permit for critical areas vs. incorporating provisions for critical areas throughout a jurisdiction's code. Section 8.3 discusses the specific elements that need to be addressed in local regulations, such as identifying wetlands, the applicability of regulations and permitting schemes, regulated activities and exemptions, wetland ratings, buffers, etc. The last section of this chapter (Section 8.4) briefly describes how to monitor the regulatory aspects of a protection program.

Regulations target site-scale activities (e.g. clearing vegetation, disturbing the soil, changing the movement of surface water and groundwater, and development together with its supporting infrastructure) that can impact adjacent and nearby wetlands (see Volume 1, Chapters 2 through 4). As discussed below and in Chapter 5 of this volume, such activities also have the potential for altering landscape processes and impacting wetlands not in the immediate vicinity of the alterations.

Important information is provided in appendices

Supporting information and additional detail on the topics discussed in this chapter are provided in a series of appendices (8-A through 8-H), listed in the shaded box on the next page. They contain examples of implementing language (e.g., for regulations, buffers, wetland ratings, criteria for technical experts, etc.) and other information. ***Chapter 8 and all of these appendices should be reviewed before a local jurisdiction decides to use any of the recommendations in this document in its critical area regulations.***

Appendix 8-A. An Overview of Ways to Protect and Manage Wetlands synthesizes the information available on what is needed to protect or replace wetland functions. The discussion is organized by the three major groups of functions (water quality, hydrologic, wildlife habitat) and by the different types of wetlands with other characteristics used in the Washington State wetland rating systems (e.g., bogs, Natural Heritage wetlands, etc.).

Appendix 8-B. Recommendations for Wetland Language in a Critical Areas Ordinance contains specific recommendations for ordinance language in a format similar to that used in many local critical area ordinances. This appendix revises the wetlands regulatory code language found in Appendix A of *Critical Areas Assistance Handbook* published by the state's Department of Community, Trade, and Economic Development (November 2003).

Appendix 8-C. Guidance on Widths of Buffers and Ratios for Compensatory Mitigation for Use with the Western Washington Wetland Rating System provides detailed guidance on buffers, ratios for compensatory mitigation, and other measures for protecting wetlands that are linked to the *Washington State Wetlands Rating System for Western Washington-Revised* (Hruby 2004b).

Appendix 8-D. Guidance on Widths of Buffers and Ratios for Compensatory Mitigation for Use with the Eastern Washington Wetland Rating System provides detailed guidance on buffers, ratios for compensatory mitigation, and other measures for protecting wetlands that are linked to the *Washington State Wetlands Rating System for Eastern Washington-Revised* (Hruby 2004a).

Appendix 8-E. Rationale for the Guidance on Recommended Widths of Buffers and Other Methods for Protecting Wetlands explains the rationale for the recommendations about buffers presented in Appendices 8-C and 8-D. It discusses why buffers of certain widths are recommended for wetlands that perform functions at different levels or for specific wetland types (e.g., bogs, etc).

Appendix 8-F. Rationale for the Guidance on Recommended Ratios for Compensatory Mitigation to be Used with the Wetland Rating Systems explains the rationale for the recommendations about compensatory mitigation ratios presented in Appendices 8-C and 8-D. It describes how mitigation ratios should be established based on risk of failure and temporal loss of functions, and can be further refined to reflect the category and type of wetland.

Appendix 8-G. Widths of Buffers Needed to Protect Some Threatened/Endangered/ Sensitive Wildlife Species Associated with Wetlands lists the widths of buffers needed to protect some of the wildlife species associated with wetlands. The species listed are the Federal Candidate, Federal Threatened, Federal Endangered species, State Sensitive, State Threatened, and State Endangered species found in Washington as of February 4, 2005.

Appendix 8-H. Hiring a Qualified Wetland Professional provides guidance on hiring a professional to provide wetlands services such as delineations, functions assessments, permit preparation, etc. It discusses the basic qualifications that should be considered by local governments and provides suggestions for locating a professional.

8.2 Issues in Establishing Regulations

Some of the key questions a local government should ask when establishing regulations that protect and manage wetlands and their functions include:

- Has a landscape analysis been conducted and have plans, policies, and zoning regulations been revised to reflect that information at the landscape scale?
- Are regulations the sole means of protecting wetlands, or are there (will there be) non-regulatory approaches that will help in protecting wetland functions?
- How much is known about the types and extent of wetlands in the jurisdiction and how they function?
- How well do the current zoning and critical area inventory maps incorporate reliable information on where wetlands and other critical areas are located?

Generally, a regulatory program should aim to prevent any further loss or degradation of wetland area or functions, thereby helping to maintain landscape processes as well. However, realistically even a very stringent regulatory program will not completely prevent all impacts to wetlands because some impacts occur as a result of land-use changes distant from wetlands. As discussed in Chapter 2, Section 2.3.4, of this volume, local government regulations may result in localized impacts upon, or even the loss of, some critical areas. However, the overall plan for the resources should result in no net loss of the value and functions of these resources within a watershed, etc. Thus, as previously mentioned, it is important to complement a regulatory permitting approach with planning based on landscape analysis as well as non-regulatory elements (these are discussed in Chapters 6, 7, and 9 of this volume). The following issues should be considered when establishing wetland regulations.

8.2.1 Balancing Predictability with Flexibility

One of the more common complaints about regulations is that they are either too unpredictable or too inflexible. Generally, these two characteristics are at odds with one another. A very predictable (prescriptive) approach provides clear, consistent standards that applicants can rely on. However, such an approach may not allow for flexibility to address site-specific or unique situations from the perspective of the resource or from that of the landowner. On the other hand, a more flexible approach may fail to provide the degree of specificity that allows applicants to have some certainty of the outcome early in the process.

In developing or revising regulations, one must consider how to balance these two competing needs. A balanced approach may set "sideboards" with criteria for selecting within the range of allowable options or a general standard with criteria for deviating from the standard. A more flexible approach implies more discretion on the part of local staff and managers.

8.2.2 Staff Expertise and the Role of Third-Party Review

As just mentioned, an important consideration in determining the appropriate regulations is the capacity of local staff to exercise independent judgment in applying protection standards, especially with a more flexible, less prescriptive approach. Flexibility requires time on the part of staff that are well versed in wetland ecology and management in order to make consistent and defensible decisions based on site- or situation-specific factors (see Chapter 11 for more discussion). Many local jurisdictions cannot afford to have this expertise on their staff and rely upon third-party review by a wetland professional who is retained by the local jurisdiction (usually at the applicant's expense), or through technical assistance from state or federal agencies (see Appendix 8-H on hiring a wetland professional).

8.2.3 Separate Critical Area Permit vs. Provisions Throughout the Code

Although critical areas ordinances are most often used as the sole regulation for wetlands and other critical areas, other code provisions may be directly relevant to the protection and management of critical areas. Some jurisdictions adopt critical areas provisions that establish a distinct permit that is required for any proposed activity within that type of critical area or its buffer. Other jurisdictions place provisions for critical areas and their buffers throughout their code, wherever consideration of impacts on critical areas is appropriate. For example, language addressing wetland/buffer protection may be adopted into clearing and grading regulations. (See Section 8.3.2 for more discussion.)

If a local jurisdiction decides to link wetland protection to other existing regulations and permits (e.g., clearing and grading regulations), it should bear in mind the issues described in the following sections (especially 8.3 and 8.3.2), as applicable.

8.2.4 Risk Management for Wetland Resources

In the end, the primary decision regarding the appropriate type and stringency of regulations for protecting wetlands is one of risk management. The key question is: *How much risk of loss or degradation of wetland functions and values is reasonable given; 1) what is known about the types of wetlands and their functions, 2) the types of land uses and their impacts, and 3) what othe, complementary components of protection, including planning based on landscape analysis and non-regulatory programs, are in place or will be implemented?* The scientific literature does not and cannot say what the appropriate level of risk should be; it can only assess the potential consequences of this type of decision. The final determination of the level of risk that is appropriate is made by government at the local level. (Risk assessment is discussed in greater detail in Chapter 10 of this volume.)

8.3 Important Elements of the Regulatory Component of a Protection Program

The current general approach to wetland regulation at the local level can be summarized as: *Avoid - Buffer - Compensate*. This means:

- **Avoid** direct impacts to a wetland or its buffer to the extent practicable by allowing impacts only when there is no reasonable alternative
- **Buffer** wetlands from indirect impacts through the retention of adjacent vegetated upland
- **Compensate** for unavoidable impacts by requiring the replacement of wetland and/or buffer area and function through the restoration, creation, enhancement, and/or preservation of wetlands and/or their buffers

This approach has been used in areas of the Puget Sound lowlands since 1984 and throughout Washington for the past 10 years. With appropriate protection standards and consistent implementation, such provisions can go a long way toward protecting wetland functions and values that are not strongly linked to landscape processes. For those that are affected by landscape processes, however, the review of the science in Volume 1 indicates that site-specific regulations alone will not protect all wetland functions.

Following is a discussion of the recommended key elements that should be addressed in the regulatory component of any local government's wetland program. For examples of recommended code language for each of these elements, please refer to Appendix 8-B.

8.3.1 Designating, Identifying, and Mapping Wetlands

The GMA requires that local governments designate and protect critical areas including wetlands (RCW 36.70A.170 and 172). The first step in regulating wetlands is to define what is being regulated and specify how these areas will be identified. The GMA provides the definition of wetlands and specifies how to identify and delineate them.

In designating wetlands for regulatory purposes, counties and cities are required to use the definition of wetlands in RCW 36.70A.030 (20):

> *"Wetland" or "wetlands" means areas that are inundated or saturated by surface water 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. Wetlands do not include those artificial wetlands intentionally created from non-wetland 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 non-wetland areas created to mitigate conversion of wetlands.

Wetlands are subject to a local government's regulatory authority if they meet the criteria in this definition. The GMA does not allow flexibility in adopting a modified definition of wetlands.

State legislation (RCW 36.70A.175) also requires local governments to use the *Washington State Wetlands Identification and Delineation Manual* (WAC 173-22-080) in implementing the GMA. The manual is used to identify the actual boundary of a wetland. The manual is based on the 1987 Corps of Engineers wetlands delineation manual and incorporates changes made by the Corps since 1987. Since the Washington State manual and the Corps manual rely upon the same criteria and indicators for hydrology, soils, and vegetation, proper use of either manual should result in the same wetland boundary.

Having reliable information about the location and extent of wetlands in a local jurisdiction is helpful to landowners and to regulatory staff. Reliable information provides greater predictability for landowners and helps ensure that wetlands are accurately identified for regulatory purposes. However, many local governments do not have accurate maps of wetlands within their jurisdiction. Inventory maps that have been checked on the ground can be time consuming and expensive to produce. Although field inventories conducted by local governments are recommended, existing information can be used to produce a useable, if less accurate, map of wetland locations.

Many local governments use a Geographic Information System (GIS) for decisions about planning and land uses and can generate a useful wetland map by combining several digital layers. The National Wetlands Inventory (NWI) can be combined with local soil surveys to produce a map that shows the approximate location, extent, and distribution of many (but usually not all) wetlands in the jurisdiction. The NWI was completed by the U.S. Fish and Wildlife Service and the soil surveys by the Natural Resources Conservation Service (formerly called the Soil Conservation Service). For many areas of the state, the NWI and hydric soil maps are available in digital format.

Two other layers of information that are also useful are 1) the maps of Priority Habitat and Species (PHS), generated from a database established and maintained by the Washington Department of Fish and Wildlife, and 2) the Flood Insurance Rate Maps (FIRMs), developed by the Federal Emergency Management Agency (FEMA). PHS data help identify fish and wildlife issues associated with wetlands that might arise. The FIRMs, although sometimes out-of-date, can be useful when used with other data, particularly when seasonal or forested wetlands may not have been mapped in the National Wetlands Inventory. Few FIRMs are currently digitized, but FEMA is in the process of digitizing all FIRMs for use with GIS.

Paper copies of FIRMs are available by calling toll-free 1-800-358-9616 or through the FEMA website: www.fema.gov (click on "FEMA flood map store"). Digitized FIRMs should be completed by around 2010 for the entire state but by 2008 for the urban centers. At this time, there are only two jurisdictions in the state (Whatcom County and the City of Anacortes) that have digital FIRMs that meet the current standards (i.e., GIS-based digital maps).

When superimposed, all of these maps can serve as a useful starting point for identifying the general location of areas that are likely to be wetlands in a planning area. However, as already mentioned, local field-based maps are superior because of the potential inaccuracy of the NWI and soil surveys, which are based on interpretation of aerial photographs (some 15 to 20 years old). This makes the existence of some wetlands as well as the extent of others hard to identify. Typically, the hydric soils maps have more field verification than the NWI maps, although aerial photography is the main source of information for both. In addition, wetland maps cannot replace the need for site- or parcel-scale delineations when activities are proposed that might affect wetlands.

To ensure the protection of wetlands, the regulatory code should contain language that clearly states that wetlands are to be regulated as they are defined in code and designated on site, not as they are mapped during inventories. In other words, areas that meet the regulatory definition of a wetland are regulated even if they are not mapped.

It is also important to understand how wetlands function and how they interact with landscape processes when applying local regulations. See the discussions later in this chapter and its appendices regarding wetland rating systems, as well as Chapter 5 for information on landscape analysis.

8.3.2 Applicability of Regulations

The applicability section of a code clarifies what types of activities the code is intended to regulate. There are two general ways in which protection measures for wetlands and other critical areas can be triggered through codes: 1) wetland provisions are integrated throughout various elements of the development code as applicable; or 2) a distinct permit for a specific critical area (e.g., wetland) is required for activities that may influence them. These two approaches are discussed below, along with a discussion of code language that address applicability and the pros and cons of each. Regardless of the approach selected to trigger the wetland protection, the code should, as mentioned previously, require that a site reconnaissance be conducted to evaluate the presence/absence of wetlands and their extent and to collect other information. This is particularly important given the limitations of wetland inventory maps as discussed above.

8.3.2.1 Protection of Wetlands Triggered by Various Development Permits

Measures used to protect wetlands or other critical areas can be initiated when any development permit (e.g., a grading, rezone, building, subdivision, short-plat permit, etc.) is required by the local jurisdiction. The code can be written to automatically allow the wetland provisions of the code to be applied to a permit when the applicant submits it. Thus, the law can be written such that the submittal of each development permit allows staff to review and condition the application with the regulatory standards for wetlands from the code.

Applicability language

Using this approach, the applicability section of the code should state that the critical areas provisions of the jurisdiction apply to "any permitted activity if a wetland or its buffer is present on the subject property, or the proposed actions could result in adverse impacts to offsite wetlands and/or their buffers." The language can specify that "all development permits" are included, or the code can specify which development permits trigger the critical area provisions. Such language makes it clear that any action within the jurisdiction that requires a permit (e.g., grading, rezoning, building permit, subdivision, etc.) will be subject to the protection measures in the critical areas code.

For example, some jurisdictions apply critical area provisions to all newly formed lots created **after** the critical area provisions have been implemented or revised (i.e., the applicability language cites the date of the adoption of the new provisions). The jurisdiction can require that all short-plats and subdivisions abide by the new wetland protection standards, **and** they may exempt single-family building permits from wetland review for such new lots. This means that the new lots will have the required critical area setbacks and buffers embedded into them, so the review of building permits for single-family homes is not necessary to assure that they meet the provisions of the code.

This also means that lots that were created **prior to** implementation of the current critical area standards (i.e., "grandfathered in") **may not** be subject to the new provisions (e.g., wetland rating, buffers, and setbacks, etc.) if it would deny all reasonable use of the parcel. This is one means to address reasonable-use provisions when new standards could possibly influence the use of an existing lot that was created under less restrictive standards. Although this may seem like a lessening of regulatory standards, it is a pragmatic approach to deal with the issue of reasonable use. This language also makes it implicit that any proposal to create new lots (e.g., a short-plat or long subdivision) requires implementation of the new standards.

Applicability language for development permits can also be modified to reduce the threshold that triggers a permit (such as a certain acreage) to zero for actions that pose a risk to wetlands and/or their buffers. For example, clearing of vegetation that falls below a minimum square footage (threshold) established for a clearing and grading permit would not trigger the requirement for the provisions for wetlands in the clearing and grading permit. However, the applicability section of the clearing and grading code can

readily be amended to note that, "There is a zero threshold for any activity which may pose an adverse impact to wetlands and/or their regulated buffers; such activities will trigger the requirements of a clearing and grading permit." By this means, existing code language can simply be modified to extend the provisions for wetland review and conditioning to actions that would otherwise not trigger the underlying permit requirements.

Pros and Con

A benefit of this approach is that no new permitting mechanism needs to be established; review and conditioning for critical areas is linked directly to existing permit processes that applicants are already familiar with. Many jurisdictions are already employing this method in their codes, and thus major code revisions and changes in processes used to review permits would not be required. Some development permits (e.g., subdivisions and some rezones) trigger State Environmental Policy Act (SEPA) determinations that may provide a mechanism for greater analysis and public input in the decision-making process than a permit process that is for wetlands only.

Initiating critical area provisions through development permits requires coordination between wetlands staff and the staff who condition and issue development permits (if they are different people). Such coordination is needed to ensure consistency in the provisions of approval for permits. The option of not having a separate wetland permit may require additional review fees for fee-supported staff (as would a distinct wetland-only permit), and may or may not require additional review time compared to a distinct wetland-only permit. There is a risk that the timing of approving multiple permits may lengthen the time required to process an applicant's permit.

For an application to be subject to wetland review and conditioning, some type of development permit (e.g., clearing, grading, filling, etc.) must be triggered. If no development permit is required for an action, no wetland review process can be legally initiated, unless the applicability language is modified as noted above.

8.3.2.2 Separate Critical Area Permit

A separate process for critical areas permits means that an applicant would be required to obtain a separate and distinct wetland (or critical areas) permit whenever a wetland or its buffer is located on the site of a proposed action. This is a distinct permit that would be required **in addition** to any other development permit for a parcel. The applicability of this permit is linked to the presence of the critical area or its buffer on a site. The standards for when a permit would be required should be the same as the provisions for the development-related permits, including zero thresholds for actions such as grading, clearing of vegetation, or other physical alterations.

Applicability language

Code language can be drafted for a wetland permit that identifies the activities that trigger the need to obtain the permit. The language would have to specify actions, development

permits, and/or thresholds of actions that would trigger a review according to the provisions of obtaining a permit. Unlike the previous option, this applicability section would have to include **all** actions or thresholds that would trigger the wetland permit: In the previous option, the applicability language of each existing development permit/action is modified to include wetland provisions. A discussion and description of suggested regulated and exempted activities follows in the Section 8.3.3.

Pros and Cons

Using a distinct wetland or critical areas permit involves many of the same issues described for the first option. The advantage of a wetland-specific permit is that it allows staff to clarify conditions of approval and perhaps, if the mechanism is established, to provide clarity for monitoring and enforcement with wetland permits. If the jurisdiction sets up a monitoring program, which is staffed to ensure that approved wetland permits are tracked and the conditions implemented, then a wetland-specific permit could facilitate such tracking and response**.**

A wetland-specific permit requires wetland staff to coordinate all conditions from all development permits for a particular project to ensure consistency for wetland protection. A wetland-specific permit could possibly result in higher permit and review fees. It should be assumed that a jurisdiction would either hire technical staff to implement a distinct permit program, or require an applicant to pay for review/conditioning of a permit by a third-party professional. The fee structure of the jurisdiction would determine whether fees would be higher for processing a wetland-specific permit compared to that needed to cover processing of multiple permits when protecting wetlands through the previous option.

There is a risk that the timing of approving multiple permits may lengthen the time required to process an applicant's permit. However, in a worst-case scenario, it is also possible that wetland staff may get backlogged in the case of wetland-only permits, in which case other development permits may be approved and issued before it. (The state law requires a 120-day "clock" for local permit review.)

8.3.3 Exempted Activities, Allowed Activities, and Exceptions

Critical areas ordinances are adopted to protect wetlands and their functions from the many types of activities that can adversely impact them as described in Volume 1. Therefore, local governments should regulate all activities with a potential to affect the functions of a wetland and its buffer. At a minimum, it is important to regulate all activities that would directly impact a wetland and its buffer such as filling, draining, excavating, clearing, flooding, and tilling. Other activities that should be included are herbicide application, stormwater discharges, and water diversions and withdrawals.

However, some activities pose little threat to wetlands and can be exempt from regulatory review or can trigger a lower level of review. Exempt activities should be limited to

those that will not have a significant impact on a wetland's structure and function (including its water, soil, or vegetation) and those which are expected to be very short term. Local governments should, however, also consider the cumulative impacts from exempted activities.

The scope, coverage, and applicability of a critical areas ordinance should capture the full range of activities that are detrimental to wetland functions. Therefore, exemptions should be supported by the scientific literature and be carefully crafted to minimize the potential for adverse impacts. Likewise, a local government should not assume that an exemption is appropriate in the absence of science to refute the exemption. The language should clearly state whether a given exemption is from applicable standards in the code or whether it is exempt from needing a permit but still must comply with the code.

The types of activities that are excluded from wetland regulation are grouped in to three categories in the example code provided in the *Critical Areas Assistance Handbook,* Appendix A (Department of Community, Trade, and Economic Development (CTED) 2003). They are *exempted activities, allowed activities, and exceptions.* These three categories allow varying degrees of activities or uses either without review, or in a way that avoids the regulations associated with critical areas, as explained in the following paragraphs.

The first category, exempted activities, are those activities that are excluded from critical areas regulations on the premise that they would have little or no effect, or that the activity is an emergency and delay of the action could result in threats to public health or safety. In addition to emergencies, these activities can include passive outdoor activities, forest practices regulated by the state, as well as specific operation, maintenance, or repair activities.

Allowed activities comprise the second category and are those activities that, due to other regulations or previous reviews, are unlikely to result in critical areas impacts. Since these activities are not exempt, the wetland standards continue to apply and the underlying permit could be conditioned to ensure that the activity complies with critical areas protection.

The third category, exceptions, are granted in limited circumstances where a reasonable use permit is issued to only allow the minimum "reasonable" use of the property and avoid a constitutional taking. Refer to Section X.10.150 of CTED's example code provisions for additional guidance on reasonable use exceptions.

The section below discusses the types of activities that are often considered as exemptions in critical area regulations and how they may apply to different types of wetlands. For each, we discuss the relevant scientific findings and provide recommendations for how they should be treated.

- Wetland size
- Size of minimum wetland impact

- Isolated wetlands
- Wetlands that are designated as prior converted croplands
- Irrigation-induced wetlands
- Clearing, grading, and placement of fill
- Ongoing agriculture
- Conversion of wetlands to new agriculture
- Conversion of agricultural lands to other uses
- Removal of noxious weeds
- Forest practices and conversions
- Removal of hazard trees
- Non-compensatory restoration and enhancement
- Stormwater management and wetlands
- Emergency activities

8.3.3.1 Wetland Size

While recognizing that local governments have to make difficult choices about where to expend their efforts, we do not believe it is appropriate to recommend a general threshold for exempting small wetlands in Washington because the scientific literature does not provide support for such a general exemption. Volume 1 (Chapter 5) documents the relationship between the lower levels of protection afforded to small wetlands and the resulting fragmentation and increase in distance between wetlands on the landscape as well as the important functions provided by small wetlands. The loss of small wetlands is one of the most common cumulative impacts on wetlands and wildlife in Washington.

If a local government, however, wants to consider exempting some wetlands under a certain size, this should be done with an understanding of the potential cumulative impacts (e.g., how many acres of wetlands would be affected, what functions would be most affected, how such impacts would be compensated, etc.). Considering and documenting the potential implications is critical to protecting wetland functions. The decision, therefore, is best made after reviewing the information generated from a landscape analysis (as outlined in Chapter 5 of this volume) for the geographic area that would be affected by the exemption.

Limiting the exemption to certain areas (such as Urban Growth Areas or specific sub-basins) and to certain wetland types (e.g., Category IV wetlands, those with non-native species, non-riparian wetlands) will help minimize the risk of losing important functions.

Additionally, it may be important to limit the total acreage of wetlands exempted on a project basis or within a sub-basin.

A more appropriate way to deal with small wetlands would be to exempt projects from the need to avoid small wetlands. This type of exemption should still require that the loss of wetlands be compensated either directly or through an in-lieu fee program.

8.3.3.2 Size of Minimum Wetland Impact

As with exempting a certain wetland size, there is no scientific basis for exempting wetland impacts under any particular size without an analysis of the cumulative effects of the exemption. A study of the management area is needed in order to measure the net result of the exemption as applied over time. If a local government chooses to move forward with an exemption for small area impacts, a restoration program and/or in-lieu fees program should be created to offset the net impacts.

Given the potential for cumulative impacts from exempting small wetlands and small impacts to wetlands, local governments should monitor and report the effectiveness of their wetland provisions or critical areas ordinances to achieve "no net loss." This is discussed further in Section 8.4 of this chapter.

8.3.3.3 Isolated Wetlands

There is no scientific justification for exempting isolated wetlands from regulation (See Chapter 5 in Volume 1). Isolated wetlands are generally defined as those wetlands that are hydrologically isolated from other aquatic features. Hydrologic isolation is not a determinant factor in the function of wetlands. Isolated wetlands in Washington perform many of the same important functions as other wetlands, including recharging 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.

The current lack of regulation of many isolated wetlands by federal agencies is the result of very different statutory language in the federal Clean Water Act that ties federal regulation to navigable waters and interstate commerce. No such restriction exists under the GMA or any other state laws.

8.3.3.4 Wetlands that are Prior Converted Croplands

There is also no scientific basis for exempting wetlands that are prior converted croplands (PCC) from wetland regulation under the GMA. Wetlands that are designated as PCC provide the same functions as other similarly degraded wetlands. The scientific information on wetlands designated as PCC is briefly discussed below, following a description of these wetlands, and is also addressed in Chapter 5 of Volume 1.

Prior converted croplands are defined in federal law as administered by the U.S. Army Corps of Engineers. PCC are those 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 (ponding) for more than 14 consecutive days during the growing season

3. Have not since been abandoned

However, many of the wetlands meeting these criteria are still *biological* wetlands (i.e., they still meet the three criteria for hydrology, soils, and vegetation) and provide important functions.

Local governments cannot exempt wetlands that are designated as PCC in their regulations and rely on the federal exemption to satisfy the best available science requirement in the GMA. Although activities in these wetlands are not regulated under Swampbuster provisions of the federal Farm Bill or Section 404 of the federal Clean Water Act, the GMA requires local governments to regulate wetlands that meet its definition. This definition of wetlands includes PCCs that meet the three criteria in the *Washington State Wetland Identification and Delineation Manual*. It therefore does not distinguish wetlands designated as PCC from other wetlands.

The original assumption behind exempting PCCs from federal regulation was the belief that these wetlands had been so altered they were no longer wetlands or no longer provided important wetland functions. In some cases, PCC have been significantly altered so they provide functions at a level that is minimal. However, in many cases, PCC provide hydrologic and water quality functions (e.g., recharging aquifers, storing flood waters, filtering pollutants from water, etc.) and may provide wildlife habitat or important linkages between habitats. For example, in western Washington, many PCC used for agriculture are ponded during the winter, when overwintering waterfowl are highly dependent upon flooded areas for resting and feeding. Overwintering bald eagles and other raptors, in turn, depend on the waterfowl attracted to these flooded areas.

Local governments that rely on the Corps of Engineers to verify wetland delineations need to ensure that wetland delineations are conducted and verified using the state wetland delineation manual to determine if they are wetlands regulated under the GMA. Once these wetlands are delineated properly, a function assessment can be conducted to analyze the functions being provided by the wetlands. Most wetlands designated as PCC will be Category III or IV wetlands under the state wetland rating systems. The departments of Ecology and Fish and Wildlife recommend that wetlands designated as PCC be regulated similarly to other wetlands (i.e., commensurate with the functions they provide).

8.3.3.5 Irrigation-Induced Wetlands

Some confusion exists as to whether wetlands that have expanded or have been formed due to the influence of irrigation are considered *artificial* and whether they are, therefore, *jurisdictional* (i.e., that is, regulated under federal, state, or local laws). Many of the habitat types with deep soils in eastern Washington have been converted to agriculture. A large portion of this land, particularly in the Columbia Basin, is under irrigation. Additionally, some agricultural areas in western Washington are also irrigated. In many irrigated areas, the groundwater table is higher than it was prior to implementation of irrigation. Many wetlands have expanded or formed adjacent to irrigation conveyance systems and in low-lying areas where irrigation occurs and downslope of irrigated lands.

The definition of wetlands comes into play when trying to clarify the situation. Artificial wetlands are addressed in definitions of wetlands used in the three state laws that regulate wetlands. These laws include the Growth Management Act (RCW 36.0A.030 (20)); the Shoreline Management Act (RCW 90.58.030 2(h)); and the Water Pollution Control Act (WAC 173-201A.020). This definition reads:

> *Wetlands means areas that are inundated or saturated by surface water 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. 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 created to mitigate conversion of wetlands,*

Basically, this definition means:

1. A wetland must have indicators of three features: water (wetland hydrology), plants (hydrophytic vegetation), and soils (hydric soils). It must have enough water to support water-dependent plants, so the water must be present during the growing season. The presence of water creates low-oxygen conditions that support those specialized plants and also creates unique soil characteristics.

2. That, for a wetland to be non-jurisdictional (artificial) it must meet both of the following characteristics:

    a. Be intentionally created

    b. Be located in a formerly non-wetland (upland) site

The term *intentionally created* and the examples given in the definition require that the artificial wetland not be the result of an accident or an unexpected byproduct of some other intentional act. Therefore, artificial, non-jurisdictional wetlands result from someone intentionally creating a water feature such as a ditch or pond in an area that is non-wetland. The only situation where an artificial, non-jurisdictional wetland results from an unintentional action is when construction of a road (after July 1, 1990) inadvertently creates a new wetland.

The term *non-wetland* means an area where wetland characteristics are lacking—that is, an upland area. Thus, if someone intentionally creates a new water feature, such as a ditch or pond, in an area that was already wetland, the "new" water feature is still under jurisdiction as a wetland.

The following examples may help illustrate real-world situations:

1. A ranch pond was built on a dry hillside to supply water to livestock, and wetland conditions have formed over time. Clearly, the pond meets both criteria for being an artificial, non-jurisdictional wetland: It is an intentionally created water feature in an upland site.

2. Wetland vegetation is found along the edge of an irrigation canal. The canal is an intentionally created water feature. If the canal was dug through uplands, then the wetland within the canal is non-jurisdictional per GMA (though it may be subject to federal regulation). If the canal was dug through an existing wetland, then the wetlands within the canal are jurisdictional.

3. A wetland is found downgradient of a leaking irrigation canal or pipe. The wetland is jurisdictional because it is an unintentional result of digging the canal. However, the canal (or a leaking irrigation pipe) can be repaired or lined to improve water conservation. If the wetland disappears as a result of the improvement, the loss of the wetland is not regulated. If wetland conditions persist, then the wetland cannot be further altered without a permit.

4. A wetland is found within a field that is irrigated. The wetland is jurisdictional because it was not intentionally created. Although filling the wetland would be regulated, changes in irrigation practices (such as changing from flood to drip irrigation) that would dry up the wetland would not be regulated.

5. A wetland is found in a field that is not irrigated, but irrigation water from a field higher up has raised the groundwater table. The wetland is jurisdictional because it was not intentionally created as part of a water feature.

6. Wetland indicators (water, plants, and soils) are found within a stormwater pond. The wetland is not jurisdictional if the stormwater pond was created in an upland. However, if the stormwater pond was created within a wetland, then it is jurisdictional.

8.3.3.6 Clearing, Grading, and Placement of Fill

The scientific literature does not support blanket exemptions for clearing, grading, and placement of fill in wetlands or their buffers without first understanding the direct and cumulative effects of such an exemption. Critical area regulations should be crafted to address these activities because of their significant and direct impacts to wetlands and their functions.

If a local jurisdiction believes it is important to exempt small amounts or areas of filling or grading in wetlands or their buffers, they should provide some analysis to document the potential cumulative impacts of such an exemption and provide some means of offsetting the expected cumulative impacts. This could include in-lieu fee and/or non-regulatory restoration programs to restore wetlands or increase wetland functions, provided that non-regulatory programs are evaluated to ensure that the no net loss goal is met.

To address cumulative effects of multiple small fills or clearings in the same wetland, the threshold for clearing, grading, or filling a critical area or its buffer should be reduced to zero.

8.3.3.7 Ongoing Agriculture

The literature synthesized in Chapters 2, 3, and 4 in Volume 1 demonstrated that agricultural activities can negatively affect wetlands. One of the goals of the GMA is to protect wetlands and other critical areas. Equally important, the GMA seeks to maintain and enhance industries that rely on natural resources, encourage the conservation of productive agricultural lands, and discourage incompatible uses. Designated agricultural lands are one of the three types of natural resource lands defined in GMA for which local governments need to plan.

The purpose of this volume is not to further evaluate or frame the issue of agricultural impacts. It is important, however, to recognize that different types of agricultural practices result in different types of potential impacts. Local governments should consider the types of agriculture being practiced in their watersheds and craft their critical area protection programs to address impacts from agriculture accordingly.

However, given that existing, ongoing agricultural activities take place in already drained and/or actively manipulated wetlands (such as grazed wetlands), impacts from bona fide ongoing agricultural activities are most effectively managed through best management practices.

The departments of Ecology and Fish and Wildlife recommend the use of best management practices (BMPs) and/or conservation plans for ongoing agricultural activities in wetlands.

There are two basic approaches that local governments should consider:

1. **Voluntary use of BMPs with monitoring.** This encourages the voluntary use of BMPs, farm conservation plans, and incentive-based programs to improve agricultural practices in and near wetlands. Local governments work with Conservation Districts or county staff with agricultural expertise regarding technical assistance to willing landowners. They should set up and implement a monitoring program to determine if the voluntary approach is effective. If problems are detected, the jurisdiction should require the use of specific BMPs and the approval of farm conservation plans in order to correct identified problems; OR

2. **Required BMPs and/or farm conservation plans.** These could be approved by an agency or organization with expertise in agricultural practices (such as a Conservation District), with appropriate local government oversight and monitoring. This type of approach is outlined in the *Critical Areas Assistance Handbook* (CTED 2003) where it describes how Whatcom County has approached this issue:

   Some agricultural uses are regulated by state or local government, usually because of a particular environmental concern related to ground or surface water or air quality. For example, Whatcom County regulates pre-existing agricultural activities that impact wetlands, fish and wildlife habitat conservation areas, and aquifer recharge areas or their buffers in conformance with an adopted conservation program. The conservation program is developed to be consistent with the Whatcom Conservation District's best management practice manual and requires the containment of livestock waste. The plan is then filed with both the conservation district and the county, to ensure that the agricultural practices are being implemented. Periodic monitoring of farm activities ensures that the management objectives are being met.

The CTED handbook acknowledges that while regulations provide certainty, they can be difficult and costly for agricultural activities, particularly without the understanding and cooperation of the landowners.

8.3.3.8 Conversion of Wetlands to New Agriculture

Conversion of wetlands that are not currently in agricultural use to a new agricultural use should be regulated by the same regulations as any new development. The scientific literature does not support the conversion of wetlands to new agricultural uses without review and conditioning through a critical areas ordinance.

8.3.3.9 Conversion of Agricultural Lands to Other Uses

A change in use from agriculture to non-agricultural uses should trigger review under the critical areas ordinance. Exemptions and special considerations for wetlands (i.e.,

targeted implementation of best management practices) crafted for agricultural activities should not be "grandfathered" when the land use changes from agriculture to another form of development. A change in use from one type of agricultural activity to another type of agricultural activity should be addressed through best management practices and farm plans.

Of particular concern is that a change in land use may be preceded by an activity that may be exempted by a local government because alterations may occur to the wetland before adequate review takes place. A common example is the exemption in many critical areas ordinances for the maintenance of existing drain tiles and ditches on drained agricultural lands. Ditches and drain tiles require maintenance from time to time in order to keep the water table low enough during the growing season for agricultural production. As long as the lands are being maintained for ongoing agricultural use, the maintenance exemption makes sense, provided that the original depth and dimension of ditches and tiles is maintained.

A critical areas ordinance should specify what constitutes "maintenance," what does not, and what documentation is necessary to prevent inappropriate or unlawful wetland draining activities. A conflict can arise when ditch and tile systems are enlarged or upgraded to effectively drain farmed wetlands so they no longer meet the definition of a wetland. This is a change in management and is the point where the local government has an interest in reviewing this change in use because new areas are being affected by the upgrade to drainage systems. Many agricultural areas often provide important habitat and other hydrologic functions (previously discussed in Section 8.3.3.4 on Wetlands that are Prior Converted Croplands).

Local governments are encouraged to work with agricultural landowners to implement the GMA's goal of protecting and enhancing agricultural lands, as well as provide notice of their authority to regulate converting wetlands, or expanding the extent of conversion, to non-wetlands for agricultural uses. This recommendation is reflected in the language in Appendix 8-B.

8.3.3.10 Removal of Noxious Weeds

Many current regulations that protect critical areas do not require a permit for the control and removal of noxious weeds in wetlands and buffers (as well as other critical areas), provided that the control is done by hand or with light equipment and does not involve the use of hazardous substances. Local governments should retain some oversight authority when more extensive control methods are proposed to make sure that wetland functions are adequately protected.

8.3.3.11 Forest Practices and Conversions

The state's Forest Practices Act (RCW 76.09 and WAC 222) regulates commercial woodlots and forest lands and contains provisions for protecting wetlands. The Act contains less stringent standards for wetland protection for commercial forestry than those required by local governments for non-forest lands through the GMA. The Forest

Practices Act does not protect forested wetlands from harvest and has weaker standards for avoidance, buffers, and mitigation than most local regulations. It provides standards for buffer protection for certain non-forested wetlands and bogs. The assumption in the Forest Practices Act is that many of the affected functions performed by forested wetlands recover during the time they regenerate trees old enough for another cycle of timber harvest.

However, the GMA requires that local governments protect the functions provided by forested wetlands. It is important for local governments to recognize and address the gap in wetland protection between the GMA and the Forest Practices Act. They should provide a framework to ensure compliance with their standards when forest lands are converted to residential, commercial, or other non-forestry uses. The jurisdiction should regulate the conversion of lands when they will no longer be regulated under the rules of forest practices. The regulations should provide guidance on how this issue will be managed in jurisdictions that contain commercial forest lands. It is important to note that the provisions should only apply when forest lands regulated by the Forest Practices Act are converted to other uses. It should not be the intent of the local jurisdiction to make the Forest Practices Act consistent with local government's more stringent requirements for forested wetlands.

8.3.3.12 Removing Hazard Trees

Provisions for the trimming or removal of hazard trees in buffers are legitimately addressed through an exemption to regulations protecting critical areas. Considering public safety is important in balancing exemptions with the goal of protecting critical areas. The needs for limits on the exemption are obvious: The exemption should be limited to situations where the "offending" tree is clearly a hazard, and removing the tree would not adversely affect the functions of a wetland or its buffer. One option is for the local government to involve a qualified arborist who has an understanding of the functions of wetlands and buffers to evaluate a request to remove a hazard tree.

The qualified arborist should establish that the hazard tree presents an imminent hazard and is threatening a structure. Some local governments use the definition in the Forest Practice Rules (WAC 222-21-010(4)) which define a *danger tree* as "any qualifying timber reasonably perceived to pose an imminent danger to life or improved property." This applies to any tree within 1.5 tree-lengths of the structure. The Washington Department of Natural Resources (WDNR) is not, however, charged with administering the requirements in the GMA. Therefore, a local government should not defer the determination of what constitutes a hazard tree, or the review of hazard tree cutting proposals, to WDNR or WDNR standards. Trees removed as hazards should be replaced either in kind or with species that are underrepresented in the community.

The exemption process should not allow for the creation of "view corridors" and the removal of healthy trees in a buffer under the pretext of control of hazard trees. When trees are removed, a restoration plan should be required. In some instances, pruning (not topping) of trees to maintain (not create) a limited view corridor may be considered by a jurisdiction as appropriate. A management plan for a view corridor, prepared by a

certified arborist, should be required by the jurisdiction. The plan should also be reviewed by qualified staff or an arborist paid by the applicant. This approach is recommended to reduce the cases of illegal clearing to create a view, leaving the jurisdiction to deal with an enforcement action.

8.3.3.13 Non-Compensatory Restoration and Enhancement

Provisions for non-compensatory restoration and/or enhancement may legitimately be addressed as exemptions through critical areas regulations. Limits, however, should be defined so that proposals narrowly focused on or managing for a single function are not allowed to occur at the expense of other wetland functions.

Restoration and enhancement activities are considered non-compensatory when they improve wetland functions (and/or increase wetland acreage) and are not meant to compensate for impacts caused by development. Many restoration activities are by definition "self-mitigating" in that they may cause temporary impacts (during construction) that are ameliorated by the significant increase in function resulting from the activity.

Some non-compensatory activities are not beneficial from a landscape perspective because they are narrowly focused or do not fit the hydrogeomorphic setting in which they are carried out. Narrowly focused activities are those that provide benefits to single species at the expense of other wetland functions. For example, in the past some waterfowl management projects have been constructed to significantly increase waterfowl production, while reducing habitat for non-waterfowl species. An extreme example would be the clearing of a forested wetland for the construction of an impoundment to attract waterfowl.

Local governments should not assume that restoration activities supported by other agencies will result in an appropriate tradeoff of functions and should carefully look at the merits of the proposal. Beneficial projects should be encouraged as a means to offset net losses in the regulatory arena, provided that they result in wetlands of the appropriate hydrogeomorphic class and are supported by landscape processes.

Local governments may also consider relaxing some of the procedural requirements typically reserved for compensatory mitigation projects. For example, a requirement for a restriction on an easement or deed for a "native growth protection area" may only serve to needlessly frustrate the proponent of a project that is non-compensatory in nature. It may be appropriate for a local government to set up a separate review process for non-compensatory projects that is focused on facilitating projects while still complying with requirements of their local protection program.

8.3.3.14 Stormwater Management

The use of wetlands for stormwater management should be included in the list of regulated activities. Most wetlands are adversely affected when they are modified to treat and/or detain urban stormwater. The literature, much of it based on research done in the

Puget Sound area, suggests that there are very narrow circumstances under which wetlands can be managed to meet the stormwater requirements of new (and retrofitted) development. While it may be appropriate in some situations to allow a wetland performing at low levels to be used as part of a system for managing stormwater, local review and permitting should be required.

Ecology has published a manual to provide local jurisdictions with technical standards and guidance on stormwater management based on the current state of the science and the best technical information available. The 2001 revision to the *Stormwater Management Manual for Western Washington* includes practices to minimize stormwater impacts on receiving waters, including wetlands, in areas west of the crest of the Cascade Mountains. The manual is used to address the effects of changes in water quality and water quantity on receiving waters such as wetlands. The 2001 Ecology manual should be used by local governments in western Washington to include best available science in developing or revising protection programs for wetlands.

In the manual, Ecology states that stormwater discharges to wetlands "shall maintain the hydrologic conditions, hydrophytic vegetation, and substrate characteristics necessary to support existing and designated uses." To accomplish this, Ecology recommends use of the amended *Wetlands and Stormwater Management Guidelines* published in Appendix I-D of the manual.

Achieving the goal of maintaining hydrologic conditions requires the use of continuous modeling and spreadsheets to track events that exceed recommended water levels in the wetland receiving the run-off. The modeling tools, such as the Western Washington Hydrology Model (WWHM) provided in the appendices of the manual, are available but applying them is difficult. As a result, Ecology intends to add a spreadsheet to the WWHM, to help with tracking these events. The model can be used to develop strategies to protect wetlands and their hydrology from the negative effects of stormwater run-off if it is calibrated for the specific drainage area. Refer to the manual for more details.

Ecology also published a stormwater management manual for eastern Washington (Ecology 2004). The manual is more limited in scope (when compared to the western Washington manual) with respect to wetland management and does not include the management guidelines for wetlands and stormwater contained in the western Washington manual.

Ecology's manual for stormwater management

Details about changes to and requirements of the stormwater manual for western Washington are available on the internet at:
http://www.ecy.wa.gov/programs/wq/stormwater/manual.html.

The manual for eastern Washington is available at
http://www.ecy.wa.gov/programs/wq/stormwater/eastern_manual/index.html.

8.3.3.15 Emergency Activities

Local codes typically include provisions for emergency activities. These are intended to provide relief from procedural requirements of the code, namely from the time delays associated with having to obtain a permit prior to responding to an emergency. Local regulations should clearly differentiate between the need to quickly permit the emergency activity and providing any compensation needed for the emergency activity after-the-fact. There is no scientific justification for exempting emergency activities from having to provide compensatory mitigation after-the-fact when the emergency action results in adverse impacts to wetlands (or other critical areas).

8.3.4 Wetland Rating

A wetland rating system is a useful tool for dividing wetlands into groups that have similar needs for protection. The scientific literature makes it clear that wetlands in Washington are very diverse (see Volume 1, Chapter 2). Wetlands occur in a wide variety of locations as a result of very different influences (e.g., geomorphology, geology, water source, etc.) and have a wide range of characteristics that contribute to different types and degrees of functions.

Wetland rating systems allow tailoring of regulations to the protection needs of different types of wetlands or degrees of function. They offer a scientifically defensible approach to assigning protection standards as well as providing a significant degree of predictability for applicants. For example, the widths of buffers and ratios for compensatory mitigation can be determined based upon a wetland rating, in addition to other factors.

A rating system for wetlands should divide them into categories based on understanding how wetlands function and how they are affected by human activities. A rating system should use clear criteria for each wetland category and include methods for determining which category a wetland is in. Without detailed methods, it is not possible to consistently apply rating criteria. The primary factors that should be used to rate wetlands are:

- The **rarity** of the wetland type
- The **irreplaceability** of the wetland type
- The **sensitivity** of the wetland type to adjacent human disturbances
- The **functions** performed by the wetland type

Ecology has revised the wetland rating systems that were previously developed for eastern and western Washington based on current wetland science. The revisions to the rating systems were determined by interdisciplinary teams that included local planners and biologists and have been field tested across the state. If a local government wants to revise one of these updated rating systems or develop its own, it should do so based on

the best available science and should include a detailed method for making site-specific decisions about categorization.

Approaches for applying protection measures by incorporating the wetland rating are discussed in Appendices 8-C through 8-F. The Washington State wetland rating systems are available at http://www.ecy.wa.gov/programs/sea/wetlan.html.

8.3.5 Requirements for Wetland Reports

Local regulations should specify when a wetland report is needed, in regard to requesting a development permit, and what should be included in the report. The Department of Community, Trade and Economic Development (CTED) provides guidance, in Appendix A of their handbook (CTED 2003), regarding what should be included in a wetland report for projects that will likely cause impacts to a wetland and require mitigation. Based on this guidance, such requirements for the preparation of wetland reports include, but are not limited to:

1. Preparation by a qualified professional
2. Use of scientifically valid methods and studies in the preparation of the report
3. Minimum contents for the report, which set the threshold for determining whether it is complete
4. Geographic limits of the study
5. Requirements for compensation, performance standards, construction plans, monitoring and maintenance, contingency plans, financial guarantees, and other details

Some projects may result in minor or "de minimus" impacts which may not require a full wetland report. In such cases, some jurisdictions may choose to implement a two-tiered process to segregate projects with de minimus impacts from those requiring more in-depth review and analysis, thereby limiting the need for comprehensive review of all permits that are submitted. To implement a tiered approach, a local jurisdiction would need to collect all information that is readily available about the site of the project and the wetland to complete an initial analysis to determine if a full wetland report is needed (e.g.. the likelihood of project to have more than de minimus impacts). Appendix F of CTED's handbook includes a "critical area identification form outline" that lists a series of indicators and information that can be used for such an analysis. In most circumstances, a jurisdiction would, at a minimum, need to have a wetland inventory that has included some field verification to determine the accuracy of the inventory.

The departments of Ecology and Fish and Wildlife recommend that the requirements for wetland reports, as outlined in the CTED handbook, be included in a local jurisdiction's critical areas code or the administrative rules adopted for implementing the code. Issues

regarding the technical ability of local staff in reviewing wetland reports are covered in Section 8.2.2 of this chapter.

8.3.6 Mitigation Sequencing

Mitigation is a series of actions that requires addressing each action, or step, in a particular order. This sequence of steps is used to reduce the severity of negative impacts from activities that potentially affect wetlands and to determine what types of impacts may be permitted and what types of compensatory mitigation may be appropriate (see the following section for a discussion of compensatory mitigation).

According to the rules implementing the Washington State Environmental Policy Act, mitigation involves the following (WAC 197.11.768):

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;*

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.*

The primary decision to be made with respect to avoidance is one of risk management. For example, using the state's system for wetland rating, impacts to Category I wetlands (which are rare, sensitive to disturbance, irreplaceable, or perform a high level of functions) are higher risk and should have to pass a higher avoidance threshold than impacts to a Category IV wetland. Category IV wetlands are usually significantly degraded, provide a low level of functions, and may be more successfully replaced. If the goal is to protect existing functions, it makes sense to apply more stringent protection to those wetlands that have a higher rating. See Appendices 8-A through 8-F for further discussion of incorporating wetland rating into regulations.

8.3.7 Compensatory Mitigation Requirements

Local regulations need to address how best to compensate for wetland area and the functions and values that will be lost due to the proposed impacts. This is called compensatory mitigation. The term mitigation is defined legally as the six-step

sequencing process described in the previous section, of which compensation is step five. Wetland impacts can be significantly reduced or avoided altogether by following the first four steps in the sequence (i.e., avoiding, minimizing, rectifying, and reducing or eliminating impacts). When wetland impacts are unavoidable, the fifth and sixth steps in the sequence are engaged (i.e., compensating for impacts and monitoring the impact and taking appropriate corrective measures).

Step five, compensating for the impact, requires considerable attention to detail because the issues are complex and the current record for compensatory mitigation is variable (see Volume 1, Chapter 6). Based on the review of the scientific literature in Volume 1, regulations addressing compensatory mitigation need to include the following:

- Standards for the type, location, amount, and timing of the compensatory actions
- Clear guidance on the design considerations and reporting requirements for compensation plans

The last requirement allows the local agency to make a decision about the adequacy of the proposed compensatory mitigation.

Ecology reports on compensatory mitigation

A two-part report on compensatory mitigation was published jointly by Ecology, the U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency. It is titled *Guidance on Wetland Mitigation in Washington State: Part 1 - Laws, Rules, Policies, and Guidance Related to Wetland Mitigation* (Ecology Publication 04-06-013a, April 2004); and *Part 2 – Guidelines for Developing Wetland Mitigation Plans and Proposals* (Ecology Publication 04-06-013b, April 2004). Access them on the internet at http://www.ecy.wa.gov/programs/sea/wet-updatedocs.htm. (The document is currently being revised).

Part 1 of this document outlines the general policies and requirements of federal and state agencies for compensatory mitigation. Part 2 provides detail on what information should be included in a compensatory mitigation plan.

Local governments are encouraged to adopt mitigation policies consistent with Part 1. This will help ensure consistency between levels of government and streamline the permitting process for applicants. The language in Appendix 8-B of this document is consistent with Part 1. Local governments should reference Part 2 as the standard for what should be included in a mitigation plan.

8.3.7.1 Standards for Compensatory Mitigation

The review of the scientific literature makes clear that compensatory mitigation has frequently failed to adequately replace wetland area and functions (see Volume 1, Chapter 6). The reasons for failure, among others, include:

- Poor site selection

- Poor site design
- Inappropriate or inadequate goals, objectives, and performance measures
- Lack of sufficient water
- Inappropriate water regime
- Poor implementation
- Inadequate maintenance
- Lack of regulatory follow-up

The reasons listed above point to a need for rigorous standards to address the type, amount, and location of mitigation projects that are permitted, and the type and extent of information that must be provided in a mitigation proposal. An adequately trained and funded regulatory staff is also vital for performing permit review, compliance monitoring, and enforcement.

Standards for compensatory mitigation should specifically address the following issues.

Goals of Compensatory Mitigation

The standards need to include a statement about the primary intent of compensatory mitigation. Is it to replace the functions being lost by the permitted impact? Is it to achieve greater area or functions? Are tradeoffs in functions allowed (i.e., allowing replacement with different functions than the functions being lost)? Generally, the goal of compensatory mitigation should be to achieve equivalent or greater area and functions.

Types of Mitigation Actions

Compensatory mitigation typically includes five basic types of activities:

- Creation or establishment of new wetlands where none previously existed
- Restoration of new wetland area and functions where wetlands previously existed (also called re-establishment)
- Restoration of wetland functions in an existing wetland area that is significantly degraded (also called rehabilitation)
- Enhancement of some wetland functions in an existing wetland that may reduce other functions
- Preservation (also called protection/maintenance) of an existing wetland that is otherwise likely to experience degradation (because it is not currently well protected by existing laws)

Standards for compensatory mitigation should specify whether any of these types of activities are preferred over others. Generally restoration (re-establishment and rehabilitation) is preferred because it is the most likely to succeed. Enhancement

typically provides the least gain in functions, and preservation always results in a net loss of wetland area; thus, these types are usually the least preferred.

Replacement of Function vs. Area

Standards should address whether wetland area and function must be replaced on an individual project basis and to what extent tradeoffs in functions can be made. *Tradeoffs* means exchanging some functions in favor of others. It is a good idea to require a minimum of 1:1 replacement of wetland area except in unique circumstances, such as when it can be clearly demonstrated that a lesser area of wetland can provide greater functions than are being lost. It is reasonable to require that compensatory mitigation replace the same functions as those lost except when tradeoffs in functions are identified as desirable in a regional plan. As a general rule, replacement of the same functions on a project basis will help ensure that significant tradeoffs are not made on the scale of a landscape or basin without fitting into clearly identified regional priorities.

Tradeoffs in functions need to be evaluated at the site and basin scale. If a function is effectively being performed in a wetland or in a sub-basin, then it may be appropriate to prioritize a function that is currently lacking or being performed at a low level. For example, a project may affect a degraded pasture near a stream that has been diked. The pasture may provide water quality improvement and limited wildlife habitat (e,g,, small mammals and raptors) but is no longer seasonally flooded, therefore diminishing its hydrologic functions. Extensive diking in the basin may have also significantly decreased the flood attenuation and desynchronization functions once provided by the wetland. Suitable mitigation, therefore, may involve removal of a dike thereby increasing hydrologic functions. This would result in a tradeoff with habitat for small mammals, which would be lost. In addition, as discussed in the next section, the removal of the dike would be off-site in relation to the wetland impact.

A real-life example is the Snohomish Estuary Wetland Integration Plan (SEWIP) (Stanley et al. 1997). The SEWIP allows a tradeoff in the types of functions provided by depressional wetlands behind dikes to those provided by restored estuarine tidal wetlands.

Location of Mitigation

Historically, most regulatory agencies required that mitigation activities be performed on-site (i.e., on or very near the same parcel where the impact occurred). This was based on the belief that the closer the mitigation was to the impact site, the better chance it would have of replacing the functions that were lost. However, recent studies have concluded that this requirement too often has forced applicants to try to fit a mitigation project into an area that makes little ecological sense and is not sustainable (Johnson et al. 2002, Johnson et al. 2000).

Mitigation standards should emphasize that mitigation activities must occur in a location where the targeted functions can reasonably be performed and sustained. For example, the site needs to have an appropriate source of water and allow for control of invasive species, and adjacent land uses need to be compatible with the long-term functioning of

the site. It is difficult to design a wetland for amphibian habitat in a location that is surrounded by dense, urban development and expect it to be sustainable.

Compensatory mitigation should not result in the creation, restoration, or enhancement of an atypical wetland. An atypical wetland refers to a compensation wetland (e.g., created or enhanced) that does not match the type of existing wetland that would be found in the geomorphic setting of the site (i.e., the water source(s) and hydroperiod proposed for the mitigation site are not typical for the geomorphic setting). Likewise, a compensation wetland should not provide exaggerated morphology or require a berm or other engineered structures to hold back water. Excavating a permanently inundated pond in an existing seasonally saturated or inundated wetland is one example of an enhancement that could result in an atypical wetland. Another example would be excavating depressions in an existing wetland on a slope, which requires the construction of berms to hold the water.

Amount of Mitigation

The acreage that should be required as compensation for lost wetland area is one of the most important and most contentious aspects of compensatory mitigation. The review of the science in Chapter 6 of Volume 1 indicates that compensatory mitigation frequently fails to produce the targeted wetland area and/or function, and it can take as long as 20 years to more than 100 years for a newly created or restored wetland to perform some functions.

The acreage of compensation required is usually expressed as mitigation ratios that are commonly used as tools to equalize the tradeoffs between the wetland lost and wetland used for compensation. While the overall goal is to replace lost functions with equivalent new functions, the reality is that it generally takes greater acreage and considerable time to provide equivalent functions. Additionally, some types of compensatory mitigation actions (e.g., enhancement, preservation) provide no new area and only a few new functions. The ratios help address the inherent disparities and act as a kind of "interest rate" to address the temporal loss of functions; there is almost always a significant time lag between when the permitted wetland impact occurs and when the compensatory wetland is fully functioning.

However, every mitigation project is unique, and it is possible to create or restore a wetland and provide greater functions than those that are being lost if the project impact is to a significantly degraded wetland. Additionally, some mitigation projects are more likely to succeed than others, particularly if good hydrologic information is available. Thus, mitigation ratios need to be flexible to address the wide range of situations that are encountered.

The recommended approach is to establish general mitigation ratios based on the wetland category and the type of mitigation activity, and then adjust the ratio on a case-by-case basis to account for project-specific factors. Criteria for increasing or reducing ratios should be specified in the standards used to protect wetlands. This provides some degree of predictability for applicants while retaining the flexibility to make site-specific adjustments.

Suggested code language for mitigation ratios is provided in Appendix 8-B. Guidance on compensatory mitigation ratios for use with the western and eastern Washington wetland rating systems is provided in Appendices 8-C and 8-D, respectively. Appendix 8-F provides the rationale behind these mitigation ratios.

Timing of Mitigation

Generally, mitigation actions are conducted concurrently with or soon after the wetland impact occurs. Standard ratios are typically established based on this assumption. If mitigation is conducted in advance of the impacts, then the risk and temporal loss are reduced and the ratio should be reduced commensurately. If the mitigation is conducted well after the impact, the ratio should be increased.

8.3.7.2 Special Types of Compensatory Mitigation

In addition to addressing the more common mitigation actions (e.g., creation, restoration, and enhancement), local jurisdictions should consider including language in their regulations specifying the circumstances under which special types of compensatory mitigation may be used, such as preservation, mitigation banks, in-lieu fee programs, and programmatic mitigation areas. These types of programs are discussed below.

Preservation

The preservation of existing wetlands as a means of compensating for wetland impacts is highly controversial because it always results in a net loss of wetland area and is perceived as trading one wetland for another one that is already protected. The reality is that some wetland types are not adequately protected under existing laws and can benefit from being placed in public ownership or protected by a conservation easement.

For example, many forested wetlands can be logged under current state laws, and wetlands with significant habitat value are very difficult to protect without large buffers and corridors to connect them to other habitats. Preservation of large tracts of wetlands and uplands can provide benefits that are impossible to achieve using typical regulatory approaches. One way to think about the issue of "net loss" with respect to preservation is that some wetlands are going to experience unmitigated impacts unless they are preserved. In that sense, preservation provides a "net gain" over what would otherwise occur.

Preservation has the following basic advantages as a compensatory mitigation tool:

- Larger mitigation areas can be set aside due to the higher mitigation ratios required for preservation
- Preservation can ensure protection for high-quality, highly functioning aquatic systems that are critical for the health of the watershed and aquatic resources that may otherwise be adversely affected

- Preservation of an existing system removes the uncertainty of success that is inherent in a restoration, creation, or enhancement project

Generally, the use of preservation to compensate for impacts is appropriate only in very limited circumstances. The preservation of a *high-quality* wetland in the same watershed or basin where a wetland loss has occurred, however, is often an acceptable form of compensation when done in combination with other forms of compensation such as re-establishment or creation. See Appendix 8-B for features indicative of high-quality sites.

Note that the use of preservation of wetlands as compensatory mitigation should not allow applicants to circumvent the standard mitigation sequence of avoiding and minimizing impacts first, followed by compensating for unavoidable losses. Additionally, preservation projects should be subject to the same requirements as other types of wetland mitigation (e.g., monitoring and long-term protection). Preservation of wetlands generally requires significantly higher ratios to offset impacts than wetland restoration or creation (see Appendix 8-C and D).

Generally, the preservation of at-risk, high-quality wetlands and habitat may be considered an acceptable part of a mitigation plan 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. Restoration (re-establishment and rehabilitation), creation, and enhancement opportunities have also been considered, and preservation is proposed by the applicant and approved by the permitting agencies as the best option for compensation

3. The preservation site is determined to be under imminent threat; that is, the site has the potential to experience a high rate of undesirable ecological change due to on-site or off-site activities that are not regulated (e.g., logging of forested wetlands). This potential includes permitted, planned, or likely actions

4. The area proposed for preservation is of high quality or critical for the health of the watershed or sub-basin due to its location

In addition, please refer to Appendices 8-B, 8-C, and 8-D for additional criteria and further guidance on the use of wetland preservation in compensatory mitigation.

Mitigation Banks

Mitigation banks offer an opportunity to implement compensatory mitigation at a regional scale and provide larger, better-connected habitat in advance of impacts. Mitigation banking involves the generation of "credits" through restoring, creating, enhancing and, in exceptional circumstances, preserving wetlands and other natural 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 geographic area in which

credits may be sold or used. Projects that use bank credits as compensation are called *debit projects*.

Wetland mitigation banks have two basic components as follows:

- **Bank site**. The bank is located at the physical site where credits for mitigation are generated by restoring, creating, enhancing, and/or preserving wetlands and associated natural resources.

- **Bank sponsor**. 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.

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 development of the bank and 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 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.

Mitigation banks benefit the aquatic environment by consolidating numerous small wetland mitigation projects into larger, potentially more ecologically valuable projects. This results in economies of scale that benefit the regulated public, regulatory agencies, and the environment.

Another important feature of mitigation banks is that they are developed in advance of the adverse impacts for which they compensate, which ensures that the bank is ecologically successful before it is used to offset adverse impacts at other sites. Mitigation banks that are properly implemented offer improved ecological performance, lower mitigation costs to permit applicants, and a more streamlined permit process.

To date, few mitigation banks have been approved in Washington. However, as the regulatory agencies develop and implement the process to review and approve banks and gain experience in evaluating proposals, mitigation banks are likely to become more common in Washington.

As with any form of compensatory mitigation, the use of mitigation bank credits to offset impacts to the natural resources should not be considered prior to completing the two mitigation sequencing steps of avoidance and minimization. Then, the regulatory agency must determine whether purchasing credits from a particular bank would provide appropriate and practicable compensation for a proposed impact. In making its determination, the regulatory agency should consider whether any opportunity for mitigation that is environmentally preferable (e.g., on-site mitigation) is available, how

closely a bank's credits correlate with the particular wetland functions that would be altered by a proposed action, and whether using a bank to compensate for a proposed action would be in the best interest of the natural resource, particularly the affected watershed.

Current information on the Ecology's Wetland Mitigation Banking Program is available at http://www.ecy.wa.gov/programs/sea/wetmitig/index.html.

In-Lieu Fee Programs

Mitigation using in-lieu fees (ILF) occurs when a permittee pays a fee to a third party in lieu 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 to a third party to replace the wetland functions that would be lost or impaired as a result of the permittee's project. ILFs are typically held in trust by a non-profit conservation organization until they can be combined with other ILFs 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 government agency that manages natural resources.

ILF mitigation is used primarily to compensate for minor adverse impacts to the aquatic resources 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 watershed
- 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
- The permit process does not adequately compensate for cumulative effects from a project

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, a 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, whereas with ILF mitigation, those activities normally are 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 should be a high priority for any ILF program. However, regulatory agencies may adjust the size of ILFs to compensate for anticipated delays in expending them.

Local governments interested in developing an ILF program should evaluate the potential for cumulative and unmitigated impacts to hydrologic and water quality functions that may result from the program. Local governments should consider the use of stormwater controls (such as over-sizing ponds and swales) as a way to replace wetland hydrologic and water quality functions on-site and reduce cumulative effects from an ILF program.

Programmatic Mitigation Areas at the Local Level

Another approach for consolidating compensatory wetland mitigation involves directing compensation projects to a *programmatic mitigation area*. Simply defined, a programmatic mitigation area is a site (or series of sites) that have been identified by the local jurisdiction or a state or federal agency as a preferable site(s) for wetland compensation. Wetland compensation projects are constructed separately on the site but are all part of a common design. The programmatic mitigation sites are subject to the same minimum requirements as other compensation sites such as permanent protection, monitoring, restrictions on other activities on the site, etc.

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

The following is a summary of how a programmatic mitigation areas work?:

1. The lead regulatory entity (county or city jurisdiction, state or federal agency) identifies an area or areas as priority restoration areas

2. The regulatory entity develops a site development plan for the entire site and may either purchase the site or purchase an easement on the site

3. As projects needing compensation arise, the applicants are 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

This approach has not been used much in Washington. The closest example available 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. Another example is along Mill Creek in Auburn where the Emerald Green Race Track and Washington State Department of Transportation located their compensation sites in an area identified in the draft Mill Creek Special Area Management Plan or SAMP (U.S. Army Corps of Engineers 1997).

8.3.7.3 Impacts to buffers

Impacts to buffers should be handled similarly as impacts to wetlands. Applicants should be required to use all available means of modifying their development proposal, as well as using existing provisions for buffer averaging, before they are allowed to build in buffers. Where buffer impacts are unavoidable, compensation should be required in the form of wetland and/or upland restoration or enhancement.

8.3.8 Buffers

Buffers are defined in many ways (see Chapter 5 in Volume 1) but generally include relatively undisturbed, vegetated areas adjacent to critical areas such as wetlands and streams. The review of the scientific literature in Chapter 5 of Volume 1 indicates that the protection of buffers around wetlands is necessary to protect wetland functions. The scientific literature also provides considerable guidance on buffer characteristics, including widths, which are necessary to protect specific wetland functions. The literature does not provide clear direction on how to structure buffer protection and management programs. However, in addition to providing technical information on buffer effectiveness, the literature provides information that should help guide the development of buffer protection policies and regulations. This information can be summarized as follows:

- Four primary factors should be considered in determining the appropriate width and character of buffers, no matter what the physical setting is:
  - The quality, sensitivity, and functions of the aquatic resource
  - The nature of adjacent land use activity and its potential for impacts on the aquatic resource
  - The character of the existing buffer area (including soils, slope, vegetation, etc.)
  - The intended functions of the buffer

- Site-specific information is needed to determine the characteristics and width of the buffer that will make it effective
- It is important to manage surface water discharges to wetland buffers to ensure effective treatment of pollutants
- Generally, buffer widths "shrink" over time as a result of infringement from adjacent activities

Ideally, this guidance should be incorporated into any local government's buffer regulations. There are, however, many different ways to incorporate this information into a protection program for buffers. The challenge for local governments in Washington is to develop approaches to buffer protection and management that include the best available science and provide a reasonable and defensible means of establishing and maintaining effective wetland buffers.

Suggested code language for buffers is provided in Appendix 8-B. Guidance on buffers for use with the western and eastern Washington wetland rating systems is provided in Appendices 8-C and 8-D, respectively. Appendix 8-E provides the rationale behind the recommended buffer widths.

8.3.8.1 Issues Regarding the Regulation of Wetland Buffers

Regulations for the protection of wetland buffers should address a number of issues:

1. Standards for buffer characteristics and width
2. Criteria and procedures for varying from a standard
3. Allowable uses within buffers
4. Best management practices to enhance and ensure effective buffer function
5. Provisions for the delineation and demarcation of buffers and their maintenance over time

In most cases, the primary concern will be "how wide does the buffer need to be?" This issue dominates any discussion of buffer regulation and generates the most conflict. However, before determining appropriate standards for buffer widths, a local government needs to decide how best to balance the need for a predictable and cost-effective approach with the desire for an approach that is both flexible and responsive to specific situations.

The options for regulatory approaches to buffers range from variable-width buffers that are determined case-by-case based on multiple site-specific factors, to fixed-width buffer standards. Between these two extremes, there are many intermediate options that combine some elements of each.

Variable-Width Approach

The case-by-case, variable-width approach is probably the most consistent with what a review of the scientific literature reveals about buffer effectiveness (see Chapter 5 in Volume 1). This approach usually requires the development of a detailed formula and methodology for considering site-specific factors such as wetland type, adjacent land use, vegetation, soils, and slope. By considering all relevant site-specific factors prior to determining the appropriate width of the buffer width, this approach helps ensure that the buffer is adequate to protect wetland functions without being any larger than is necessary.

However, this approach is time-consuming, costly to implement, and provides a less predictable outcome. It requires either that the applicant hire a consultant to conduct the necessary analysis, or that the government agency staff conduct the analysis. In either event, the local government staff must have appropriate training and expertise to conduct or review the report produced. In addition, this approach initially requires considerable effort when the formula and methodology for site-evaluation is developed. This approach also does not provide any predictability for applicants. They have no idea how large a buffer may be required until considerable time and money are invested in the analysis. Using a case-by-case, variable-width approach can also result in attempts to manipulate the site-specific data, lead to frequent haggling with applicants, and create the perception that buffer widths are determined in an arbitrary and capricious manner.

Fixed-Width Approach

By contrast, a fixed-width approach provides predictability and is relatively inexpensive to administer. The downside of this "one-size-fits-all" approach is that it results in some buffers being too small to adequately protect wetland functions and some buffers being larger than necessary to protect wetland functions. Over time, this inequity may erode public and political support for the buffer program. Frustrated landowners can point to the "over-regulation" of those buffers that are larger than necessary, while environmentally-minded citizens can point to those buffers that are smaller than needed to protect wetland functions.

It also is difficult to determine an appropriate standard width, because no single-size buffer can be demonstrated to protect all wetland types adequately in all situations unless that standard width is very large. Furthermore, it is difficult to argue that an approach using fixed widths includes the best available science since the scientific literature clearly recommends different buffer widths based on a variety of different factors. While no local governments in Washington currently use a single, fixed-width approach, there are several states that do (e.g., California, New Hampshire, New Jersey).

Combining the Fixed-Width Approach with Site-Specific Variables

There are several ways to modify an approach using standard, fixed widths to incorporate some of the factors that contribute to the effectiveness of buffers. Some drawbacks of the fixed-width approach can be rectified by using a wetland rating system that divides wetlands into different categories based on specific characteristics. Then, different

standards for buffer width can be assigned to each category. This approach provides predictable widths, yet allows some tailoring of buffer widths to wetland functions.

For example, as previously mentioned, the Washington State wetlands rating systems divide wetlands into four categories based on rarity, sensitivity to disturbance, irreplaceability, and functions. This hierarchical rating allows one to establish larger standard buffer widths for those in higher categories wetlands and smaller standard buffers for those in lower ones. Most local governments in Washington currently designate buffer widths based on the state wetland rating systems or a rating that is similar.

Another way to address site-specific factors while using fixed widths is to have different widths based on the type of adjacent land use, thus incorporating the four factors, discussed earlier, that are known to influence the effectiveness of buffers. A buffer regulation could require a larger buffer width for adjacent land uses with intense impacts and a smaller buffer width if the impacts from adjacent land uses are low. This strategy can be combined with a wetland rating system to provide a more scientific and defensible approach.

Other critical factors, such as the characteristics of the buffer itself and the functions of the buffer that are desired, can be addressed by establishing criteria and procedures for varying from a standard width. This approach allows for some site-specific tailoring of the standard widths on a case-by-case basis without the need for developing a detailed formula or methodology for determining the widths. In this approach, criteria for increases or reductions from the standard buffer width are developed, and the applicant or any other interested party is given the option of "making a case" as to why the standard buffer width should be increased or decreased. Agency staff then evaluate the proposal against the criteria and decide if such a deviation is warranted.

The criteria for allowing a deviation from the standard buffer width should include the various buffer characteristics that in the scientific literature have been determined to be most important. These include slope, soil type, vegetative cover, and/or the habitat needs of particular wildlife species. For reducing standard buffer widths, an applicant should have to demonstrate that a smaller buffer will protect the functions and values of the wetland. This will generally require hiring a qualified expert and preparing a site-specific report for the local government's review and approval. It is also important to have a minimum buffer width below which the buffer cannot be reduced.

Protecting wildlife species that are threatened, endangered and sensitive

Threatened, endangered, and sensitive (T/E/S) species need specific protection, but this protection cannot be accomplished using the protection measures linked with wetland rating systems. If a T/E/S species is found living in or using a wetland, the appropriate state or federal agency should be consulted to determine what is necessary to protect that species. This information can be considered an "overlay" on the wetland rating. A wetland containing T/E/S species should be protected to meet the requirements of the species as well as the measures associated with its rating category. The T/E/S species using the wetland may need larger buffers or other considerations (e.g., no disturbance during the nesting season).

For example, a Category II riverine wetland that provides overwintering habitat for endangered Coho may need larger buffers than those recommended for a Category II wetland that would protect fish that are not T/E/S species.

For these reasons, it is important that wetland rating forms be used in conjunction with detailed guidance on using the rating forms**. Inadequate protection for listed species may result if rating systems are misapplied.** See Appendix 8-G for buffer widths for some threatened, endangered, or sensitive wildlife species associated with wetlands.

8.3.8.2 Reasonable Use Criteria

Another situation in which standard buffer widths may need to be reduced on a case-by-case basis is when protection of the buffer will result in a property owner being denied reasonable use of his/her land. For example, if a landowner has a one-acre parcel that was zoned for one single-family residence and a wetland covers 80% of the parcel, protection of a buffer around the wetland might mean that the parcel is rendered undevelopable. In this case, the landowner would have a strong case that protection of the wetland and buffer would deny him/her all reasonable use of the property. However, if the buffer were reduced, it may be possible to construct a single house on the property and avoid a "takings" claim.

Thus, critical area regulations should include a provision allowing for buffer reduction in situations where reasonable use would be denied. Such a provision should include requirements that the applicant demonstrate that there are no feasible alternatives to reducing the buffer such as revising the development design, that critical wetland functions or public health and safety will not be impaired, and that the inability to derive reasonable economic use of the property is not the result of the applicant's own actions. For example, a landowner may divide the property in a way that created an unbuildable lot after the adoption of critical area regulations.

Reduction of wetland buffers increases the risk that the remaining buffer will be degraded and encroached upon over time. The allowance for the reduction should be coupled with

requirements for permanent fencing and revegetation. Periodic monitoring may also be necessary. Significant reductions in buffers may require off-site mitigation for the reduced buffer.

8.3.8.3 Buffer Averaging

Buffer averaging is a tool for balancing buffer protection with specific site needs for development, or for tailoring a buffer to maximize protection of natural features in the wetland or surrounding upland. It allows a buffer to vary in width around a given wetland. For example, if the standard width for a buffer around a wetland is 100 feet, buffer averaging would allow the width to vary between a minimum and a maximum width but require that the buffer area average 100 feet in width. Typically this is done to allow development to occur closer than usual to the wetland in order to fit a particular development "footprint" onto a given site. However, it can also be used to protect a natural feature (e.g., a stand of trees or snags) that otherwise would fall outside of the standard buffer. Buffer averaging can also be used to provide connections with adjacent habitats or to address those situations where pre-existing development has reduced a buffer area to a width less than the required standard.

Criteria for averaging buffer widths typically require a minimum buffer width (either a designated width or a percentage of the standard buffer width) and documentation to ensure that the averaging of the buffer will improve, or at least, not impair overall buffer functions. Ideally, buffer widths should be narrowed in an area where it will cause the least disturbance and widened in an area where it will benefit the wetland the most.

8.3.8.4 Uses Within Buffers

Another critical issue that buffer regulations need to address is the type of uses that are allowed within buffers. Generally, buffers should be maintained in vegetation. However, uses that could be considered are some stormwater treatment facilities (e.g., bioswales) or trails to provide for some form of recreational use. In addition, over time, residents adjacent to the buffer might want to use it for some activity. Thus, it is essential that buffer regulations address which uses are allowed in buffers.

Generally, any use that results in the creation of impervious areas, clearing of vegetation, or compaction of soils will be incompatible with buffer functions. Typically, buffers need to be densely vegetated with appropriate native vegetation to perform water quality and habitat-related functions. In most cases, this requirement precludes any human uses of the buffer. However, it may be necessary in some situations to use the outer area of the buffer for initial treatment of surface water runoff, via the construction of biofiltration swales or water-spreading devices to ensure sheet flow.

In other situations, it may be desirable to allow some focused use of the buffer for educational and recreational activities and to prevent widespread disturbance of the buffer. If it appears inevitable that adjacent residents will use the buffer to gain access to a wetland for aesthetic or recreational enjoyment, then it may be preferable to concentrate that use in a smaller area and minimize disturbance of the soil, vegetation, and habitat by

constructing trails, viewing platforms, or similar facilities. Additionally, providing some educational or recreational developments in buffers may enhance the general public's understanding and appreciation of wetlands and their functions and values.

Many regulations include criteria for evaluating proposals for use of buffers. These criteria typically include general language about prohibited uses but allow for variances if certain conditions are met. Care should be taken to ensure that low-impact trails are not later upgraded to paved trails that encourage activities with greater impacts. Construction of trails can allow greater access for pets to the wetland or wetland buffer and increase predation on fish and wildlife species. Regulations should minimize the impacts from trails and interpretive facilities to the extent practicable.

8.3.8.5 Enhancement and Restoration of Buffer Areas

Frequently, upland areas adjacent to wetlands have been altered by previous land-use practices. In many cases, the vegetation has been cleared or significantly degraded and the soil has been disturbed. Also, it is not uncommon to find that the existing buffer area is composed of non-native vegetation. In these situations, simply "protecting" a buffer with a set width may fail to provide the necessary characteristics to protect a wetland's functions. It is usually desirable, therefore, to restore the buffer to a more naturally vegetated condition.

In other cases, a buffer area may be in relatively good condition but still be sparsely vegetated with trees and shrubs. It may be desirable in this case to improve the screening and habitat value of the buffer by planting additional trees and shrubs or other vegetation appropriate to the ecological setting.

Buffer regulations should be designed to ensure that buffers provide adequate protection of wetland functions. Standard buffer widths should be set based on an assumption that the buffer is well vegetated. In cases where the buffer is not well vegetated, it is necessary to either increase the buffer width or require that the standard buffer width be revegetated. Generally, a well-vegetated buffer will function substantially better than a poorly vegetated buffer. Regulations can essentially give the applicant the option of revegetating the existing buffer in order to have the standard width or foregoing buffer restoration and providing a wider but poorly vegetated buffer.

Requirements for re-vegetating buffers should specify that the buffer be vegetated to a condition that is comparable to an undisturbed plant community in the ecoregion. Buffer enhancement and restoration requires the same diligence as wetland enhancement and restoration and requires monitoring and follow-up to ensure success.

8.3.8.6 Best Management Practices to Enhance or Ensure Effective Functions of Buffers

Water Quality Protection

A buffer's effectiveness at improving water quality is largely a factor of how polluted water travels across and through the buffer. The scientific literature has many references to pretreatment practices that enhance a buffer's effectiveness at removing pollutants, thereby reducing the width of buffer necessary.

In areas with agricultural or silvicultural land uses, the primary pollutants of concern are sediments, nutrients, and pesticides. Narrow (15- to 30-foot-wide) grass filter strips have been shown to be effective at removing coarse sediments and adsorbed pollutants as well as helping encourage sheetflow and infiltration of surface runoff, thus enhancing a buffer's effectiveness at removing remaining pollutants. Therefore, requiring or encouraging the construction of a narrow grass filter strip between agricultural or silvicultural areas and wetlands and their buffers is strongly advised.

In urban areas, the pollutants of concern are primarily sediments and metals from roads, parking lots, and construction sites. Adequate treatment of stormwater runoff is critical to remove most of the pollutants and to reduce peak flows prior to discharge to a wetland or its buffer (see below for more discussion of stormwater). To encourage sheetflow and infiltration, stormwater should be dispersed through a shallow infiltration trench at the outer edge of the buffer (i.e., farthest from the wetland).

In residential areas, the pollutants of concern include sediments, metals, nutrients, and pesticides (from lawns). A combination of appropriate stormwater treatment and the use of a grass filter strip or grassy swale is recommended to pretreat and disperse surface runoff prior to introduction into a buffer.

In rural residential areas, the primary concern is pollutants such as nutrients and fecal coliform from animals. Many hobby farms in rural areas house livestock that should be kept out of wetlands and their buffers.

Stormwater Management

In addition to the introduction of pollutants, development adjacent to or upgradient from a wetland can alter the quantity and timing of surface water and/or groundwater inputs to the wetland. Considerable research has documented the adverse impacts from changes in wetland hydroperiod. The scientific literature also shows that upland buffers around wetlands do little to ameliorate these impacts except in wetlands with small contributing basins. (See Chapter 4 in Volume 1 for further discussion.)

Thus, it is imperative that adequate stormwater management practices be applied to any project adjacent to or upgradient from a wetland. This includes such practices as the construction of settling/detention facilities as well as treatment with a grassy swale. Inadequately detained and treated stormwater will overwhelm a buffer's ability to filter and treat pollutants. Direct surface discharges to buffers usually result in surface flow

that is channeled, which significantly reduces pollutant removal and can erode buffers. (Refer to Chapter 3 in Volume 1 for additional information on disturbances caused by urbanization.)

Wildlife Habitat

The two primary actions that can be taken to reduce impacts to wildlife habitat are to 1) ensure that the wetland and its buffer are connected to other habitat areas, and 2) reduce the intrusion of noise, light, people, and pets.

Ensuring connectivity is usually an issue of site design. Some wetlands are already isolated from other habitat areas, and it will not be possible to provide connectivity. On sites where wetlands are currently connected to other habitat areas, it is important to maintain that connectivity through corridors. While the scientific literature indicates that wildlife travel corridors should be as wide as 500 feet, it may be beneficial to provide a corridor of any size. Generally, corridors of less than 100 feet will only provide the cover needed for small mammals and less-sensitive birds.

Local wildlife experts should be consulted to determine the appropriate corridor design for a given site. Buffer averaging can be a useful tool to help ensure connectivity with adjacent habitat areas without unduly burdening the landowner.

Reducing the intrusion of noise, light, people, and pets can be accomplished in many ways. Buffers vegetated with dense trees and shrubs are effective at reducing intrusion of noise and light. Additionally, projects can be designed to reduce noise and light intrusion by locating noisy areas such as parking lots, playgrounds, and loading docks away from the edge of the buffer. Lighting can be designed and located so it points away from the wetland and its buffer. Fences or berms can be constructed to block noise and light. Fences can also be used to limit human and pet intrusion. Dense shrubs, particularly those with thorns, can be planted along the edge of a development to block noise and light and limit intrusion.

With forethought and careful planning, projects can be designed to reduce impacts to wildlife habitat. When combined with adequately vegetated buffers of sufficient width, these measures can help ensure that disturbance to wildlife use of a wetland is minimized.

8.3.8.7 Issues in Managing Buffers

Many steps need to be considered to ensure that, once established, buffers continue to provide the functions for which they were protected. These steps frequently are overlooked or given scant attention by local governments, resulting in the degradation of buffers over time.

Ownership of the Buffer

The issue of who owns the area included within a buffer is an important one. There are basically two options:

- The buffer area can be included in a separate tract or lot and held in common ownership by a homeowners association, agency, or non-profit organization
- The buffer can be included in lots owned by adjacent landowners

The second option is often pursued by a developer who wants to divide the buffer among individual lots in order to achieve a required minimum lot size. However, a study by Cooke (in Castelle et al. 1992) of buffer areas in two counties in western Washington showed that buffers that were owned by many different lot owners were more likely to be degraded over time. Even with easement language on each lot owner's deed specifying the buffer protection provisions, owners tend to clear buffer vegetation over time to expand lawns, build storage sheds, or serve other uses.

If the buffer area is not held in some kind of common ownership, it is much more difficult to take enforcement action against those landowners who encroach upon its boundaries. Therefore, when feasible, wetlands and their buffer areas should be placed in a separate, non-buildable tract that is owned and maintained by an organization that is dedicated to protecting the buffer. The boundaries of the tract should be clearly marked to help prevent unintentional encroachments.

Buffer Delineation, Recording, and Signage

Clearly delineating and marking a buffer area helps ensure that it is not degraded over time. Following project approval, and prior to site construction, the buffer should be measured, recorded on applicable legal documents, and clearly marked on the ground. During the construction phase, constructing a temporary sediment fence or "clearing limits" fence helps to ensure that the boundary is seen by equipment operators and that the wetland and buffer are protected from erosion during construction. Following construction, a fence may still be desirable to demarcate the boundary and to limit human and pet access and reduce the intrusion of noise and light.

Placement of signs along the buffer boundary is important for two reasons: to help mark the boundary, and to help educate landowners about the purpose and value of protecting buffer areas. In areas with high potential for human intrusion and degradation of the buffer, more extensive signage explaining the value of the buffer may be necessary to develop support for protecting the buffer. In addition to signs, brochures can be developed and distributed to adjacent landowners to explain the reasons why buffers and wetlands are protected and what human activities are allowed. Typically, applicants are responsible for developing and constructing fences and signs and for distributing educational materials. However, local jurisdictions can develop standards for fences, signs, and educational materials to ensure consistency and effectiveness. Maintenance of fences and signs is typically the responsibility of the adjacent landowner or a homeowners association, if applicable, or lies with the local jurisdiction.

Maintenance of Buffers

In cases where enhancement or restoration of a buffer is required, monitoring and maintaining the buffer area is essential. A monitoring/maintenance program should include evaluation of the success of plantings and provide for contingency measures if vegetation survival standards are not met. Responsibility for this is usually borne by the developer or landowner. It is also important to monitor buffer areas when human use is allowed or expected. Adverse effects of human access such as vegetation trampling, littering, and soil compaction or erosion should be monitored and corrected if found. Local jurisdictions can develop and implement a buffer maintenance and monitoring program but few have done so. Alternatively, applicants can be required to monitor and maintain buffers and submit regular reports to the local jurisdiction.

Enforcement

Simply designating and marking the boundaries of buffer areas is not sufficient to protect buffers in all cases. Regular observation of buffer areas is critical to determine whether vegetation and soils are being damaged and to ensure that adjacent development does not encroach on the buffer over time. Where illegal activities occur, enforcement actions to restore the buffer may be necessary. Local jurisdictions should establish a program to observe the buffer over time and take enforcement actions when necessary, similar to programs for private stormwater or wastewater facilities.

8.3.8.8 Buffers in Urban Areas

A frequent concern about buffers is their applicability to urban and urbanizing areas. The concerns generally fall into two categories: 1) the science on buffers comes largely from agricultural and forestry settings and is perceived to be irrelevant to urban areas; and 2) the need to maximize density of development in urban areas is in direct conflict with the protection of large upland areas around wetlands (and streams).

The concern over the relevancy of the literature on buffers to urban areas is largely unfounded. While most of the studies of buffer effectiveness occur in non-urban settings, the principles are the same. Buffers do not function any differently in urban settings than in rural settings. The same processes of sediment, nutrient, and toxics removal operate similarly in urban areas as they do in rural settings. However, a good stormwater management program can reduce the need for buffers to perform filtration functions, with the exception of lawns and landscaped areas which drain into wetlands rather than into stormwater collection areas.

The role of buffers in providing needed upland habitat for wetland species and in screening adjacent noise and light is also performed similarly. In fact, a case can be made that buffers in urban areas are even more important from a habitat standpoint because there is little other upland habitat available. The factors that may be different in urban areas are that urban wetlands may perform some functions at a lower level because of degradation, and the range of wildlife species utilizing urban wetlands may be smaller. However, remaining wetlands (and adjacent upland areas) in urban areas may, in fact,

function as habitat islands and be critical to many species. Generally, the protection of wildlife habitat functions of wetlands requires larger buffers than protection of water quality functions, particularly when state-of-the-art stormwater management is employed.

However, the best way to address the issue of buffers in urban areas is to conduct a landscape analysis and develop a subarea plan that identifies, prioritizes, and protects the most important wetland, riparian, and upland habitats (see Chapters 5 through 7 of this volume for additional discussion). Maintaining and restoring connections between wetland, riparian, and upland habitats is key to protecting wildlife. A landscape analysis can help identify existing connections that should be protected as well as areas where connectivity can be restored. Combined with standards for low impact development and state-of-the-art stormwater management, this kind of approach could result in smaller buffers around the other critical areas that are not providing vital habitat. The studies should always be confirmed on the ground during project review.

The issue of balancing wetland protection with competing mandates in the GMA is a legitimate one that can be addressed in a number of ways. A buildable lands survey with a good wetlands inventory can provide important information on the actual conflicts that may exist (rather than a perceived conflict). Provisions to allow density trading from buffers to adjacent or nearby developable lands can help.

8.4 Monitoring the Effectiveness of the Regulatory Component of a Protection Program

A local government should be able to track the effects of decisions made in the implementation of its critical areas ordinance and produce regular status reports for the public to review. This is an important step to demonstrate that the goals and requirements of the GMA are being met. The following are examples of questions that should be answered:

- How many wetlands have been affected by permit decisions?
- How many acres have been filled?
- How much and what type of mitigation was required?
- How many requests for buffer reductions have been granted? (Associated questions include: how many projects included buffer increases, how narrow/wide was the buffer reduction/increase, how many acres of buffers were involved in buffer reduction/increases, and was off-site mitigation required as part of the buffer reduction?)
- How many projects included provisions for wildlife corridors to connect adjacent wetlands? (An associated question is: how many acres of upland buffers were affected by these buffer considerations?)

- How well have the mitigation projects succeeded in replacing wetland acreage and function?
- How many variances have been issued? (Associated questions include: how many exemptions have been granted, and how many violations have occurred?)
- How many emergency waivers have been issued? (An associated question is how many required after-the-fact mitigation?)
- How much non-compensatory restoration is being done?
- How many acres of impacts have been avoided, by basin?

Without the collection of these data, a local government cannot evaluate how well it is doing in moving toward a goal of "no net loss goal" for its regulation. Furthermore, these data are an integral part of a local government's adaptive management approach because they allow decision-makers to improve the regulations based on real data.

Monitoring does not have to be complicated but should be linked to the goals established for the regulations (discussed in Section 8.2). A regulation with rigid requirements will not require as much data collection as one that relies on case-by-case flexible implementation. Flexible programs by design represent a higher risk to wetlands because case-by-case decision-making can lead to greater cumulative effects than more rigid regulatory programs. (See Balancing Predictability with Flexibility in Section 8.2.1). Many of these data can be collected as part of follow-up work for permit compliance.

This chapter has not outlined the minimum features to include for monitoring because they are entirely dependent on what language is adopted in code. See Chapter 12 of this volume for additional information on monitoring and adaptive management.