Critical Areas Assistance Handbook

Protecting Critical Areas Within the Framework of the Washington Growth Management Act

washington state department of
community, trade and economic development

Critical Areas Assistance Handbook:

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I. Introduction

The purpose of this guidebook is to help Washington communities design locally appropriate programs for designating and protecting critical areas. The protection of critical areas is essential to preserving our natural environment and protecting the public's health and safety. Protecting critical areas helps reduce exposure to risks, such as landslides or flooding, and maintains the natural elements of our landscape. Critical areas provide a variety of benefits: clear drinking water, enhanced water quality, wildlife habitat, and managed flood risks, to name a few. Protection of critical areas is necessary to preserve these benefits and to reduce the hazards associated with some critical areas. The functions and values of critical areas, once lost, can be costly or even impossible to replace.

There are five critical areas identified in the Growth Management Act (GMA).[1] They are:

- Wetlands.
- Areas with a critical recharging effect on aquifers used for potable water.
- Frequently flooded areas.
- Geologically hazardous areas.
- Fish and wildlife habitat conservation areas.

Paul Inghram

Each city and county in Washington state has the responsibility to perform the complex task of identifying, designating, and protecting those critical areas found in their local environment. This document is intended to provide support for this work.

Multiple approaches to critical areas protection are suggested, including regulatory and nonregulatory methods. Protecting critical areas involves a variety of strategies, from the adoption of conservation policies in comprehensive plans, to the designation of appropriate open space and land uses. Subdivision ordinances are also important in how communities plan for open space and plan for the retention of important natural landscape features. The adoption of ordinances such as critical areas regulations are also important because they provide the administrative review and approval process for regulating land uses that may impact critical areas.

The suggestions in this guidebook are not mandatory, for there is no single best approach to critical areas protection for all communities. Each city or county must decide which approaches to critical areas protection are appropriate to apply locally, consistent with the requirements of the GMA and the community's future vision. This guidebook does not create any new standards or requirements, nor does it establish any new legal authority. Its purpose is solely to provide a

[1] See RCW 36.70A.030(5).

resource to local governments in designing their critical areas protection programs by discussing issues and presenting examples for consideration.

This document also provides references to other resources and contacts to help jurisdictions identify potential sources of aid. Given the changing nature of regulations, natural resources, and science, this document will be revised periodically to reflect new information and new requirements.

This document only addresses critical areas as defined by Washington's GMA. Other state and federal regulations may have different requirements applicable to critical areas.

Organization

This handbook is organized for ease of use by cities and counties that are developing local critical areas protection programs. The topics included in this handbook are organized sequentially following a pattern a city or county might follow when developing a critical areas protection program, starting with an introduction to critical areas and why they need to be protected, identifying critical areas locally, and finally developing a critical areas protection program that includes regulatory and nonregulatory components. The final section provides information about how to find assistance drafting and implementing critical areas protection measures.

Example Code Provisions

In addition to the assistance information included in the handbook, example codes for designating and protecting critical areas are included in the appendices on the CD-ROM and agency Web site versions of this publication. These example codes include the *Example Code Provisions for Designating and Protecting Critical Areas*, a collection of regulatory language prepared by the Washington State Department of Community, Trade and Economic Development (CTED). Note that because the Example Code Provisions found in Appendix A are general in nature, they will need to be modified in consideration to local environmental conditions and community needs. Likewise, while the local examples included are valuable references, your community may have conditions that need to be addressed differently depending on local environmental conditions and community values. The Example Code Provisions and other critical areas ordinances are designed as a framework of basic ordinance language. Local governments can then focus their efforts on customizing the ordinance to be consistent with local conditions and values.

A glossary of terms is included at the end of the Example Code Provisions.

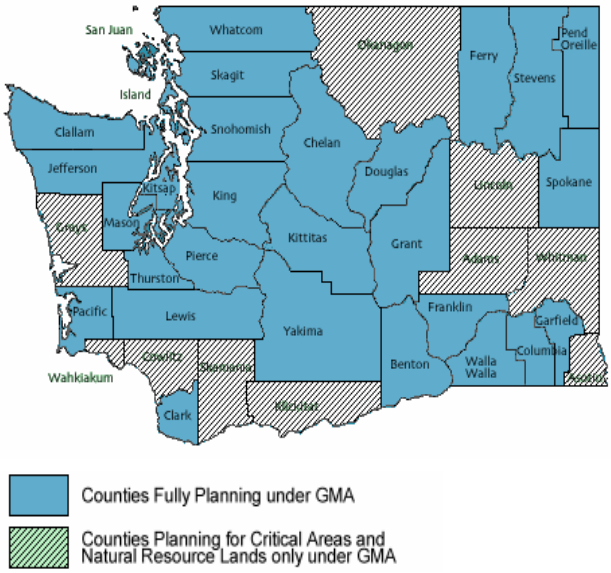
Requirements of the Growth Management Act

All counties and cities are required to designate and protect critical areas functions and values by the Growth Management Act.

The GMA requires that comprehensive land use plans and development regulations, including critical areas regulations, be subject to continuing review and evaluation by the county or city that adopted them. In 2002, the Legislature amended the GMA to require counties and cities to take legislative action to review and, if needed, revise their comprehensive land use plans and development regulations to ensure the plans and regulations comply with the requirements of

the act according to a seven-year cycle.[2] In 2005, the Legislature provided an additional year for completion of critical area ordinances for many jurisdictions.[3]

The schedule is established to begin on or before December 1, 2004, and every seven years thereafter for Clallam, Clark, Jefferson, King, Kitsap, Pierce, Snohomish, Thurston, and Whatcom counties and the cities within those counties. For Cowlitz, Island, Lewis, Mason, San Juan, Skagit, and Skamania counties and cities, the timeline is on or before December 1, 2005, for comprehensive land use plans and development regulations and December 1, 2006, for CAOs, and every seven years thereafter. For Benton, Chelan, Douglas, Grant, Kittitas, Spokane, and Yakima counties and the cities within those counties, it is on or before December 1, 2006, for comprehensive land use plans and development regulations and December 1, 2006, for CAOs, and every seven years thereafter. And the timeline is on or before December 1, 2007, for comprehensive land use plans and development regulations and December 1, 2008, for CAOs, and every seven years thereafter for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grays Harbor, Klickitat, Lincoln, Okanogan, Pacific, Pend Oreille, Stevens, Wahkiakum, Walla Walla, and Whitman counties and cities within those counties.



All counties and cities are required to designate and protect critical areas, including those that are "partially planning" under GMA.

The level of review should depend on several common-sense factors. For example, if the jurisdiction contains significant, extensive, and/or inadequately protected critical areas, a more detailed review of its policies and development regulations may be necessary. If the review process identifies inconsistencies within the plan or regulations or between the plan and regulations, these should be corrected. To assist local governments with the process of reviewing elements of their comprehensive plans and development regulations, such as critical areas ordinances, CTED has developed an update checklist (Appendix B).

A well-documented record that reflects the assumptions should support local governments' decision-making and facts relied upon, the analysis used, and the conclusions reached. Once adopted, the comprehensive plan and critical area ordinance should contain a "Findings of Fact" statement that documents this process. To assist local governments with this process, a sample Findings of Fact statement has been developed (Appendix C).

Counties and cities are required to include the best available science in developing policies and development regulations to protect the functions and values of critical areas. In addition, counties and cities are required to give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.[4] Anadromous fish are those

[2] See RCW 36.70A.130.
[3] See HB 2171
[4] See RCW 36.70A.172(1).

that spawn and rear in fresh water and mature in the marine environment, including salmon and char (bull trout).

Although not all counties and cities are fully planning under the GMA pursuant to RCW 36.70A.040, all counties and cities in the state are required to adopt development regulations to protect critical areas. While local governments have broad discretion in developing comprehensive plans and development regulations tailored to local circumstances (including critical areas regulations), that discretion is bounded by the goals and requirements of GMA.[5]

Recognizing the Value of Critical Areas Protection

Critical areas perform key functions that enhance our environment and protect us from hazards. The beneficial functions and values provided by critical areas include, but are not limited to, water quality protection and enhancement; fish and wildlife habitat; food chain support; flood storage, conveyance, and attenuation (the slow release) of flood waters; ground water recharge and discharge; erosion control; wave attenuation; protection from natural hazards; historical, archaeological, and aesthetic value protection; and recreation. Identifying the functions and values of local critical areas is essential in defining the purpose of a critical areas protection program.

Each critical area performs different functions and each community assesses the values of the critical areas in their environment differently. Therefore, the purpose of protecting critical areas is unique for each community. Critical areas protection is essential to protect the public's health and safety, and can be used to comply with state and federal laws. Additionally, there are economic reasons to protect critical areas. Critical areas support resource industries, such as salmon and shellfish harvesting. If the functions of critical areas are not protected now, attempting to restore them in the future is likely to be costly, if not impossible.

For every community, there are at least three reasons for protecting critical areas:

- To protect the public from threats to human safety and to protect public and private property from natural hazards.
- To meet the goals of the GMA to protect the environment and enhance the state's quality of life.
- To preserve those environmentally sensitive areas that are valuable to the public and provide ecological function.

In addition to protecting critical areas, the GMA also directs local governments to identify lands useful for public purposes and to identify open space corridors (RCW 36.70A.160) within and between urban growth areas "useful for recreation, wildlife habitat, trails, and connection of critical areas."

Wildlife corridors are needed to maintain connectivity, provide access to larger habitats, and allow populations to interbreed. At the largest scale, wildlife corridors must be wide enough to allow easy movement for even the largest mammals. However, smaller wildlife corridors can provide habitat connectivity for other species, including amphibians, fish, and birds. Continuous riparian corridors provide both aquatic and terrestrial connectivity. In urban areas, such corridors will provide significant recreational opportunities and important linkages in a highly fragmented

[5] See *King County v. CPSGMHB*, 142 Wn.2d 543, 555-59 (2000) (King County II).

landscape. Whenever possible, urban and rural parks and open spaces should be linked to form functional wildlife corridors, which can then be ultimately joined to outlying habitat patches.

Local Importance

Communities protect critical areas in response to the high value that citizens in Washington state place on natural resources and open space preservation. Cities and counties are encouraged to work with the public and to prioritize their community's goals towards critical areas protection. Natural resource decisions are made every day, with or without a blueprint for the future. By planning now for critical areas protection, communities can allow development to move forward and ensure the state's natural heritage and high quality of life is protected and enjoyed by many generations to come.

Paul Inghram

Implementing the Growth Management Act

The GMA requires all counties and cities in Washington to adopt development regulations to protect designated critical areas. The Western Washington Growth Management Hearings Board (WWGMHB) described RCW 36.70A.060(2) as imposing a *duty* on local governments to adopt development regulations that protect critical areas. Inherent in that duty is the requirement that the regulation contain *appropriate and specific criteria and standards to ensure protection*.[6]

All designated critical areas must be protected, but not all critical areas must be protected in the same manner or to the same degree.[7] To "protect" critical areas generally means to preserve

[6] See *Whatcom Environmental Council v. Whatcom County*, WWGMHB No. 95-2-0071 (Final Decision & Order, December 20, 1995); *Willapa Grays Harbor Oyster Growers Association v. Pacific County*, WWGMHB No. 99-2-0019 (Final Decision & Order, October 28, 1999).

[7] See *Tulalip Tribes of Washington v. Snohomish County*, CPSGMHB No. 96-3-0029 (Final Decision & Order, January 8, 1997); *Pilchuck Audubon Society v. Snohomish County*, CPSGMHB No. 95-3-0047 (Final Decision & Order, December 6, 1995); *Easy v. Spokane County*, EWGMHB No. 96-1-0016 (Final Decision & Order, April 10, 1997); *Confederated Tribes & Bands of the Yakama Indian Nation v. Yakima County*, EWGMHB No. 94-1-0021 (Final Decision & Order, March 10, 1995); *Save Our Butte Save Our Basin Society v. Chelan County*, EWGMHB No. 94-1-0015 (Final Decision & Order, August 8, 1994); *Clark County Natural Resources Council v. Clark County*, WWGMHB No. 92-2-0001 (Final Order, November 10, 1992).

their functions and values.[8] The required standard of protection should be to prevent adverse impacts or, at the very minimum, to mitigate adverse impacts.[9]

Development in critical areas is not absolutely prohibited under the GMA, so long as the functions and values of the critical areas are protected.[10] While local governments have discretion to adopt critical areas regulations that may result in local impacts upon some critical areas, or even the loss of some critical areas, there must be no net loss of the structure, value, and functions of the natural systems constituting the protected critical areas.[11] A county or city must provide a detailed and reasoned justification for any critical area not protected.[12] To accomplish this, local critical areas data should be developed and relied upon when making land use decisions.

All such planning and development decisions must include the best available science.[13] This science is used when assessing how critical areas function and how best to protect them from existing or future development. The locally applicable scientific data that is relied upon includes research and assessment data, monitoring data, inventory, and survey data for each critical area. Where this level of information has not been developed, relying on expert opinion or synthesis literature may be helpful in understanding how critical areas function and how land use decisions should be made.

[8] See RCW 36.70A.172(1); WAC 365-195-825(2)(b).

[9] See *Save Our Butte Save Our Basin Society*, EWGMHB No. 94-1-0015 (Compliance Hearing Order, April 8, 1999, and Final Decision & Order, August 8, 1994); *English v. Board of County Commissioners of Columbia County*, EWGMHB No. 93-1-0002 (Final Decision & Order, November 12, 1993).

[10] See *Knapp v. Spokane County*, EWGMHB No. 97-1-0015 (Final Decision & Order, December 24, 1997); *Association to Protect Anderson Creek v. Kitsap County*, CPSGMHB No. 95-3-0053 (Final Decision & Order, December 26, 1995); *Pilchuck Audubon Society v. Snohomish County*, CPSGMHB No. 95-3-0047 (Final Decision & Order, December 6, 1995).

[11] See *Tulalip Tribes of Washington v. Snohomish County*, CPSGMHB No. 96-3-0029 (Final Decision & Order, January 8, 1997); *Pilchuck Audubon Society v. Snohomish County*, CPSGMHB No. 95-3-0047 (Final Decision & Order, December 6, 1995).

[12] See *Friends of Skagit County v. Skagit County*, WWGMHB No. 96-2-0025 (Final Decision & Order, January 3, 1997); *Whatcom Environmental Council v. Whatcom Council*, WWGMHB No. 95-2-0071 (Final Decision & Order, December 20, 1995).

[13] See RCW 36.70A.172(1).

II. Developing a Protection Program

Each community is encouraged to design a comprehensive program to protect critical areas. More than just a regulatory ordinance, a local program should include land use policies, critical areas regulations, and zoning standards and may include nonregulatory programs. Recognizing unique environments and the local values of each community, each local program should be specific to the individual community's needs.

There are qualitative differences among critical areas. Not all areas and ecosystems are critical for the same reasons. Some are critical because of the hazard they present to public health and safety, some because of the values they represent to the public welfare. In some cases, the risk posed to the public by use or development of a critical area can be mitigated or reduced by engineering or design; in other cases that risk cannot be effectively reduced except by avoidance of the critical area. Hence, counties and cities need to recognize the differences among these areas and to develop appropriate regulatory and nonregulatory actions in response.

Protection of the functions and values of critical areas does not mean a prohibition of all uses or development within or adjacent to these areas. Rather, it means governing changes in land uses, new activities, or development that could adversely affect critical areas. Thus for each critical area, counties and cities should prepare development regulations that govern changes in land uses and new activities by prohibiting clearly inappropriate actions and restricting, allowing, or conditioning other activities as appropriate. In determining how to develop those regulations, jurisdictions should consider whether a permit is or should be required for the activity and how to address existing uses in or near critical areas. These decisions will vary by a jurisdiction's type and quality of critical areas and other factors.

Communities are encouraged to utilize a variety of tools, including nonregulatory programs, to protect critical areas. Nonregulatory programs help to reduce the regulatory burden on landowners and may be more effective in some situations. Restoration can be achieved through nonregulatory programs for the impacts of existing and new development. Regardless of the mix of tools a community chooses to include in its program, each community must, at a minimum, meet the GMA requirement to adopt development regulations to designate and protect critical areas (the GMA requirement is discussed in more detail in Section I). Regulations may be stand-alone critical areas regulations or integrated into existing development regulations. Often, they are a combination of both.

Steps to Developing a Local Critical Areas Protection Program

There are several key steps to designing a local critical areas program, which ideally can be worked on concurrently:

1. **Identify** – Identify those critical areas found locally. A current inventory (a type of the best available science) mapping critical areas should be assembled in order to recognize the types and distribution of critical areas within the jurisdiction. Open space networks should be planned that help to link important habitat and other critical areas together in a contiguous pattern. This information will help evaluate how critical areas function (or need to function) and can serve as a basis for classifying lands with critical areas.

2. **Include the Best Available Science** – Assemble and review relevant data on the local area that represents the best available science so as to understand the functions and values of the

critical areas and how to best protect them. CTED's publication *Citations of Recommended Sources of Best Available Science* provides a good starting point. Additionally, resource agencies can provide good synthesis documents that summarize the science for some critical areas.

3. **Set Goals and Policies** – Develop comprehensive plan goals and policies for protecting critical areas, including establishing the "purpose" and setting policies to support both regulatory and nonregulatory actions. These policies can be reflected in the development of the critical areas program, including the critical areas ordinance.

4. **Designate and Protect** – Develop and adopt regulations that provide criteria to designate the precise areas that meet the definition of "critical area." Develop and adopt regulatory (zoning, subdivision codes, clearing and grading, critical areas regulations) and nonregulatory measures (conservation easements, public education, transfer of development rights, etc.) to protect those designated critical areas. Protection of critical areas should result in a set of performance measures designed to protect the functions and values of each critical area. Protection measures may include a mix of development regulations and nonregulatory programs that together can demonstrate that protection of functions and values is occurring.

Identification of the type and the general location of critical areas is the necessary first step in determining what critical areas are present. When the extent and variety of local critical areas is known, goals and policies should be developed that establish the foundation for actions, both regulatory and nonregulatory, to protect those critical areas. Policies should also address the use of the best available science and establish the public values the community places on critical areas.

Once the types of critical areas have been identified, they should be formally designated by ordinance. Designating critical areas defines those specific characteristics (or classification criteria) of a critical area that require protection. For example, wetlands may be classified into four different categories and each category of wetland may have a different characteristic that should be protected differently. Lastly, the program should include specific measures to protect critical areas. Such performance measures should be consistent with the predominate scientific knowledge.

III. Identifying Critical Areas

The first step in designing a local program, which should occur prior to developing or updating protective measures, is the identification of locally occurring critical areas.

Identifying local critical areas allows the jurisdiction to focus regulations on those critical areas that are most likely to occur and that require the most effort to protect. *As it is difficult to know where all critical areas occur, all critical areas do not need to be identified or mapped to develop a critical areas protection program.* A complete exhaustive inventory can be costly and is unnecessary. The initial identification of critical areas should be thorough enough to provide planners and decision makers with a general inventory of the types and approximate quantities of critical areas found locally. This information is useful for identifying lands that are well suited for urban development and those better suited to rural or low intensity uses. Some critical areas, such as wetlands, can be difficult to identify and may only be determined during development review.

Note that not identifying all critical areas does not weaken the effect of critical areas protection. Ordinances often include language to designate critical areas even when all critical areas may not have been identified at the time of adoption.

Identification Techniques

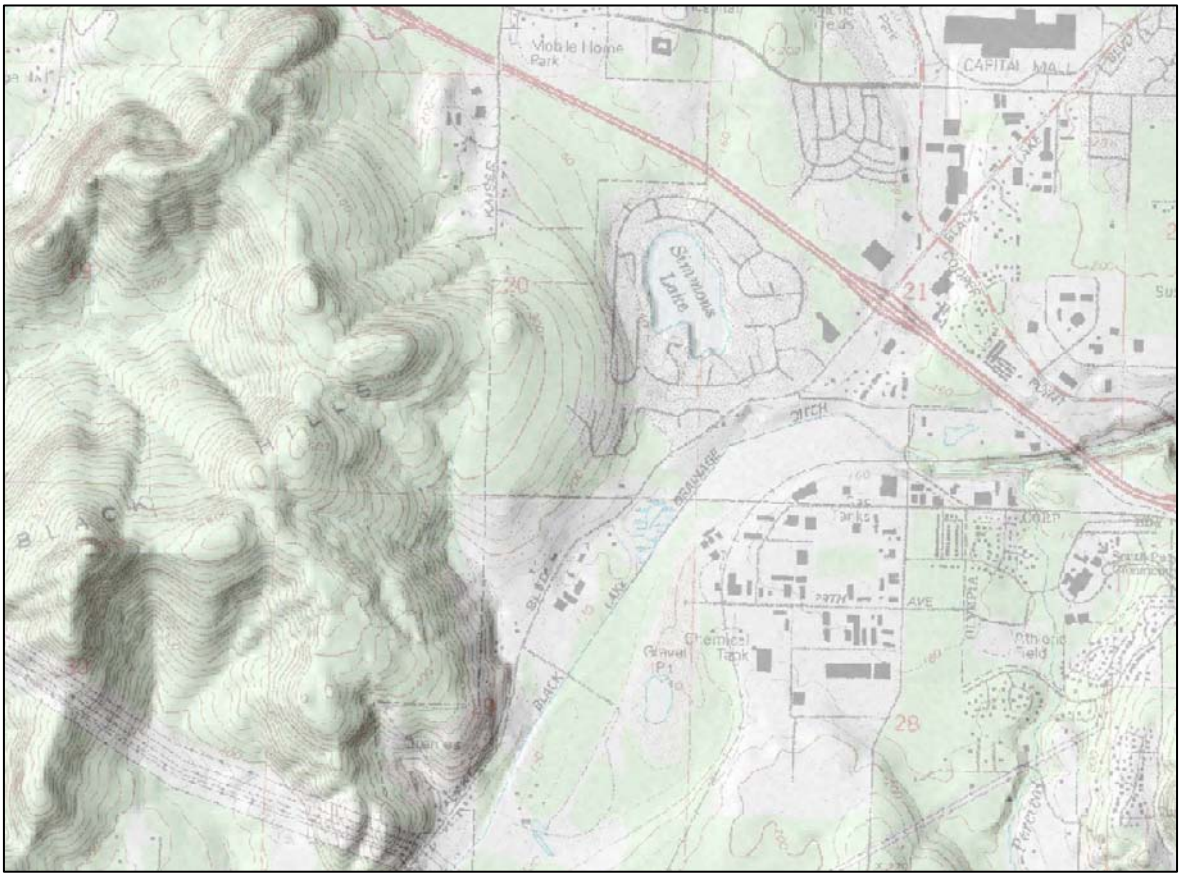
The following are techniques that communities use successfully to identify the presence of critical areas:

- **Experienced staff** – With years of experience planning for a geographic area, staff are often already familiar with the types and locations of many critical areas.
- **Aerial photographs** – By providing a broad view of an area, including those areas that are less accessible, aerial photographs are a good way to locate critical areas that are recognizable from above.
- **Geologic and soil maps** – The Washington State Department of Natural Resources (DNR) has compiled a series of geologic maps that can assist in identifying geologic hazards and in some cases subsurface water flow patterns. (http://www.dnr.wa.gov/geology/hazards/ & http://www.dnr.wa.gov/geology/mapindex.htm) Surficial geology combined with soils information can reveal important information about underground water movement and relationships with wetlands and streams. The National Resources Conservation Service (NRCS) has soil maps for most areas of the state that can assist in identifying hydric soils and historic wetlands, even in highly modified environments.
- **Geographic Information Systems (GIS) data** – Many critical areas have been mapped on existing GIS and CAD data available from various agencies and past development projects.
- **Important fish and wildlife species maps** – The Washington Department of Fish and Wildlife maintains a GIS database that contains information on important fish and wildlife species and includes several databases including Priority Habitats and Species (http://wdfw.wa.gov/hab/phspage.htm & http://wdfw.wa.gov/hab/science/index.htm), Wildlife Heritage (http://wdfw.wa.gov/viewing/wildarea/wildarea.htm), National Wetlands Inventory, and Washington Rivers Information System. Maps and digital information are available from the Priority Habitats and Species page at: http://wdfw.wa.gov/hab/release.htm
- **Other jurisdictions** – If a neighboring or encompassing jurisdiction has completed a critical areas inventory, that information may be applicable for locations that are geographically adjacent.

- **Landscape-scale Assessment** – Guidance on using a landscape-scale assessment process to protect aquatic ecosystems is available from the Department of Ecology at http://www.ecy.wa.gov/biblio/0506027.html.

Mapping

The approximate location and extent of critical areas and open space networks that are identified by the community should be shown on maps available to the public and used for land use planning. Mapping data prepared by other agencies that identify critical areas, such as the National Wetlands Inventory, or provide information that helps to identify critical areas, such as soil maps, should also be publicly available and used in preparing land use plans. It may be appropriate to adopt maps prepared locally or those prepared by other agencies as the official critical areas maps.



USGS Map

Even when maps are locally adopted as "official," it is likely that the mapped data is not an exhaustive inventory of the critical areas that exist. Mapping is often completed at a large scale that makes it impossible to precisely record the location of critical areas. Therefore, it is recommended that counties and cities should clearly articulate that the maps are for information or illustrative purposes only unless the map is an integral component of a regulatory scheme.

Users of the maps should be made aware that maps may be continuously updated as new critical areas are identified, that maps are a reference, that they may not show all existing critical

areas, and that they do not provide a final critical area designation. The exact location of a critical area should be determined through the performance of a field investigation by a qualified professional.

For Washington state and local government GIS data:
http://www.mrsc.org/byndmrsc/gis.aspx

Mapping and GIS resources that may be helpful in identifying where critical areas occur include:

- The National Wetlands Inventory.
- Soil maps produced by U.S. Department of Agriculture National Resources Conservation Service.
- Federal Emergency Management Agency flood insurance maps.
- Coastal Zone Atlas (for marine bluff hazards).
- U.S. Geological Survey landslide hazard, seismic hazard, and volcano hazard maps.
- Washington State Department of Natural Resources seismic hazard maps for Western Washington.
- Washington State Department of Natural Resources slope stability maps.
- National Oceanic and Atmospheric Administration (NOAA) tsunami hazard maps.
- Washington Department of Fish and Wildlife Priority Habitat and Species Maps.
- Washington State Department of Natural Resources Official Water Type Reference Maps.
- Washington State Department of Natural Resources Puget Sound Intertidal Habitat Inventory Maps.
- Washington State Department of Natural Resources Shorezone Inventory.
- Washington State Department of Health Annual Inventory of Shellfish Harvest Areas.
- Anadromous and resident salmonid distribution maps contained in the Habitat Limiting Factors Reports published by the Washington Conservation Commission.
- Washington State Department of Natural Resources State Natural Area Preserves and Natural Resource Conservation Area Maps.

Washington State Department of Ecology *Digital Coastal Atlas*:
http://www.ecy.wa.gov/programs/sea/SMA/atlas_home.html

IV. Including the Best Available Science

In 1995, the Washington State Legislature added a new section to the GMA to ensure that counties and cities include reliable scientific information when adopting policies and development regulations to designate and protect critical areas. The new section to the GMA, RCW 36.70A.172, requires all counties and cities in Washington to "include the best available science in developing policies and development regulations to protect the functions and values of critical areas."

The Legislature considered this new requirement an important step towards regulatory reform and making timely project permitting decisions. Local governments' understanding of where on the landscape critical areas occur, how they naturally function, and how best to regulate land uses that may impact critical areas natural processes is important in ensuring that zoning and project permit decisions are be made without the need to complete expensive environmental review and new studies at the permit level. Good upfront planning and the adoption of scientifically defensible development standards should lead to quicker permit decisions.

While science is not the sole criterion to be used in developing critical areas policies and regulations, the Legislature singled out science for special mention. Rather than imposing any particular statewide standard, the Legislature opted to defer to local decision making when determining how to "include" the best available science.

The objective of including science is "to protect the functions and values of critical areas." Science plays a central role in delineating critical areas, identifying functions and values, and recommending strategies to protect their functions and values. Scientifically valid information should help with an evaluation and discussion of the applicability, relevance, and limitation, if any, of the science that is contained in the record. Following enactment of RCW 36.70A.172, science-based recommendations cannot simply be disregarded in favor of competing considerations. Informed decision making requires that decision makers receive scientific information that has not been filtered through screens of competing interests.

What Constitutes the Best Available Science?

Local governments must identify, collect, and assess the available scientific information relating to the protection of critical areas within their jurisdiction, and then determine which of that science constitutes the "best available science." Local governments may accept or solicit scientific information from state and federal agencies, universities, tribes, subject matter experts, and others, but the burden ultimately is on the local government to determine whether the scientific information assembled in fact constitutes the best available science.

The Best Available Science Rules

In September 1998, the Washington State Department of Community, Trade and Economic Development (CTED) convened a technical team comprised of planners and scientists from state agencies and local governments to address the uncertainties regarding the inclusion of the "best available science" for critical areas designation and protection. Building on the work of the technical team, and following an extensive public dialog, CTED adopted six new sections to the Procedural Criteria, Part Nine, WAC 365-195. The best available science rules are codified at WAC 365-195-900 through 925 and took effect August 27, 2000.

WAC 365-195-900 explains the statutory context and purpose of the new best available science rules.

WAC 365-195-905 explains what is the "best available science."

WAC 365-195-910 offers recommendations as to where local governments can obtain the best available science.

WAC 365-195-915 provides criteria for demonstrating that the best available science has been "included" in the development of critical areas policies and regulations.

WAC 365-195-920 explains what to do if a county or city cannot find enough scientific information applicable to its critical areas.

WAC 365-195-925 explains what it means to give "special consideration" to the protection of anadromous fisheries.

The best available science rule is available on the CTED Web site. CTED has published a compilation of possible sources of science in the publication ***Citations of Recommended Sources of Best Available Science for Designating and Protecting Critical Areas, March 2002***, which can be found at *http://cted.wa.gov/_CTED/documents/ID_874_Publications.pdf*.

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What Does It Mean to "Include" the Best Available Science?

Local governments must substantively consider the best available science when adopting policies and development regulations to designate or protect critical areas. The adopted policies and regulations must protect the functions and values of critical areas. If the local government determines this protection can be ensured using an approach different from that derived from the best available science, the local government must demonstrate on the record how the alternative approach will protect the functions and values of critical areas.

The WWGMHB interpreted the inclusion requirement as imposing a substantive requirement on local governments. A local government must go beyond mere designation and protection mechanisms and ensure that the real reason for identification and protection of critical areas (the preservation of their functions and values) is being accomplished.[14]

To determine whether a local government has included the best available science, the WWGMHB held it would examine each case individually, applying three factors:
(1) "The scientific evidence contained in the record."
(2) "Whether the local government's analysis of the 'scientific evidence and other factors involved a reasoned process.'"
(3) Whether the local government's decision was within the parameters of the GMA as directed by the provisions of RCW 36.70A.172(1).[15]

[14] See *Clark County Natural Resources Council v. Clark County*, WWGMHB No. 96-2-0017 (Final Decision & Order (December 6, 1996).
[15] *Id.*

In general, the broader the scientific evidentiary disputes, the greater discretion a local government has in choosing its course of action, within the limits of discretion imposed by the GMA.[16]

WAC 365-195-915 provides criteria for demonstrating that the best available science has been "included" in the development of critical areas policies and regulations. The local government's record supporting adoption of those policies and regulations should include the following:

- The specific policies and regulations adopted to protect the functions and values of critical areas.
- Copies of (or references to) the best available science used in the decision making.
- The nonscientific information used as a basis for departing from science-based recommendations.
- The rationale supporting the local government's reliance on the identified nonscientific information.
- Actions taken to address potential risks to the functions and values of the critical areas the policies and regulations are intended to protect.

Special Consideration for Anadromous Fish

When developing policies and regulations to designate and protect critical areas, local governments must give special consideration to measures necessary to preserve or enhance anadromous fisheries. This requirement to focus on protection measures for anadromous fish is imposed in addition to the requirement to include the best available science.

WAC 365-195-925 explains what it means to give "special consideration" to the protection of anadromous fisheries:

- The county or city should take the same steps it takes to demonstrate it has included the best available science. It should make a record showing that its critical areas policies and regulations identify and address "conservation or protection measures necessary to preserve or enhance anadromous fisheries" that are grounded in the best available science.
- The "conservation or protection measures" for anadromous fisheries should include measures that preserve or enhance habitat for all life stages of anadromous fish.

- The life stages of anadromous fish can be tied to the following general habitat requirements:
- Adequate but not excessive stream flows.
- Cool, well-oxygenated, unpolluted water.
- Streambed gravels that are relatively free of fine sediments.
- Instream structural diversity (interposed pools, riffles, hiding and resting cover).
- Unimpeded migratory access to and from spawning and rearing areas.
- Complex estuarine and nearshore habitats that support food production, migratory cover, and physiological transition between fresh and salt water.

These habitat requirements and life cycle needs should be given special consideration when developing critical area protection programs. This can be done many different ways including ensuring riparian corridors and vegetation management along shorelines are preserved to help provide large woody debris for structural diversity, lower water temperature, nutrient input, and shoreline stabilization. Flood hazard mitigation is important, as well as ground water discharge, to ensure adequate but not excessive stream flows for anadromous fish.

[16] *Id.*

Methods to protect water quality and ensure that there is cool, well-oxygenated, unpolluted water should be taken into consideration. Erosion control and stormwater management are needed to keep fine sediments from entering the stream and reducing spawning gravel quality or harming aquatic invertebrates utilized as food sources. Maintenance and protection of wetlands is also important for preserving adequate water recharge to streams during low flow periods, as well as important habitat for amphibious species and insects that are potential food sources for fish.

V. Setting Goals and Policies

Not all areas and ecosystems are critical for the same reasons. Some are critical because of the hazard they present to public health and safety, some because of the values they represent to the public welfare. In some cases, the risk posed to the public by use or development of a critical area can be mitigated or reduced by engineering or design. In other cases, that risk cannot be effectively reduced except by avoidance of the critical area.

Program Goals

Consistent with environmental policies adopted in comprehensive plans and county-wide planning policies, a critical areas protection program should establish goals that seek to:

- Protect members of the public and public resources and facilities from injury, loss of life, or property damage due to landslides and steep slope failures, erosion, seismic events, volcanic eruptions, or flooding.
- Maintain healthy, functioning ecosystems through the protection of unique, fragile, and valuable elements of the environment, including ground and surface waters, wetlands, and fish and wildlife and their habitats, and to conserve the biodiversity of plant and animal species.
- Direct activities not dependent on the use of critical areas resources to less ecologically sensitive sites and mitigate unavoidable impacts to critical areas by regulating alterations in and adjacent to critical areas.
- Prevent cumulative adverse environmental impacts to water quality, wetlands, and fish and wildlife habitat, and the overall net loss of wetlands, frequently flooded areas, and habitat conservation areas.
- Promote the enhancement of ecological processes through conservation and restoration measures.[17]

These goals may be used both to establish policy support for critical areas regulations and to define the purpose of a critical areas ordinance. Integrating both the environmental policies and regulations within the critical areas regulations will help to maintain consistency between the comprehensive plan and other critical areas program elements.

Environmental Policies

Minimize Land Use Incompatibilities

Counties and cities should consider using innovative land management techniques that minimize land use incompatibilities and most effectively maintain critical areas. Techniques to conserve and protect critical areas include the purchase or transfer of development rights, fee simple purchase of the land, less than fee simple purchase, purchase with leaseback, buffering, land trades, conservation easements, or other innovations which maintain current uses and ensure the conservation of these lands.

No Net Loss

With protection of critical areas, it is important to understand that protection does not mean that critical areas will not be impacted. Rather, impacts to high-quality critical areas should be

[17] See WAC 365-195-925.

prohibited except in limited circumstances. Impacts to other critical areas can be minimized or avoided with mitigation requirements. When impacts cannot be avoided, new development must replace the lost functions and values through mitigation. For jurisdictions planning under the Shoreline Management Act (RCW 90.58.020), policies and regulations should be adopted that ensure at minimum, no net loss of ecological functions necessary to sustain shoreline natural resources.[18]

The 2005-07 *Puget Sound Water Quality Management Plan* challenges jurisdictions within the Puget Sound basin to seek a net gain in area and function of marine and freshwater habitats, acknowledging that past activities resulted in significant loss. Local governments should be encouraged to participate in regional restoration projects. Nonregulatory restoration projects can be used to enhance existing functions and values. An updated *Puget Sound Water Quality Management Plan* is currently being drafted and can be found on the Puget Sound Action Team Web site at http://www.psat.wa.gov/Publications/07-09_plan/07-09_plan.htm.

In 2000, Washington State developed a statewide plan, called *Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution*, to protect natural resources from nonpoint pollution. This was a collaborative effort involving a wide range of agencies. It identified gaps in existing programs, set a strategy for improving those programs, recommended timelines, and outlined methods for evaluating progress.

In 2005, the plan was updated. The revised plan highlights improved coordination and cooperation between state agencies.

The five-year update was developed in three volumes:

- Volume 1: Water Quality Summaries for Watersheds in Washington State (formerly Appendix A).
- Volume 2: identifies major state and federal programs used to help identify and control nonpoint sources of pollution. (This volume is currently being revised to meet requirements of the 1990 Coastal Zone Act Reauthorization amendments.)
- Volume 3: identifies the state's priority management strategies to control nonpoint source pollution for the next five years. Many lessons were learned from the previous five years' implementation activities. Volume 3 captures these lessons. The management strategies in Volume 3 build on these lessons by developing a set of activities that promote connections and relationships.

The most important lesson learned during the first five years of nonpoint plan implementation is the importance of fostering relationships at the local level. It was also determined that the majority of nonpoint source pollution is generated through local land use activities. To control polluted runoff, state and federal agencies, local governments, tribes, special purpose districts, and citizens all need to work together.

[18] See proposed WAC 173-26-186(8) and 201(2)(C).

VI. Designating Critical Areas

Designating critical areas is an important part of a successful critical areas ordinance. When critical areas are not precisely designated, they may go unprotected even if the protection measures are otherwise very strong. In making the designation, counties and cities must consider the minimum guidelines established pursuant to RCW 36.70A.050. The state adopted guidelines for critical areas are located in Chapter 365-190 WAC, the *Minimum Guidelines to Classify Agriculture, Forest, Mineral Lands and Critical Areas*.

Critical areas may be designated by adopting specific performance standards, delineating specific geographic areas, or both. Generally, performance standards are preferred, as any attempt to comprehensively map wetlands, for example, throughout a jurisdiction would likely be too inexact for regulatory purposes. Even so, mapping critical areas for information purposes is advisable.

All areas meeting the definition of one or more critical area type, regardless of any formal identification, are required to be designated critical areas. Recommendations for designating each type of critical area are listed below.

Suggested code language to define and designate critical areas is listed within the Example Code Provisions in Appendix A. The CD and agency Web site versions of the handbook also include examples of critical areas codes from jurisdictions throughout the state.

RCW 36.70A.170(1) requires that all appropriate critical areas in all counties and cities must be designated. The GMA permits no exemptions, exclusions, or limitations on applicability that would result in some critical areas not being designated. The growth management hearings boards have held that local governments must designate and protect all five categories of critical areas listed in RCW 36.70A.030(5) within their jurisdiction where they occur, unless a particular category of critical area is not present or the local government can demonstrate the critical areas are adequately protected by existing development regulations.[19, 20] Local governments may also designate and protect categories of critical areas other than those listed in RCW 36.70A.030(5).

Designating Wetlands[21]

The wetlands of Washington state are fragile ecosystems that serve a number of important beneficial functions. Wetlands assist in the reduction of erosion, siltation, flooding, ground and surface water pollution and provide wildlife, plant, and fisheries habitats. Wetlands destruction or impairment may result in increased public and private costs or property losses.

In designating wetlands for regulatory purposes, counties and cities are required to use the definition of wetlands in RCW 36.70A.030(20). Counties and cities are encouraged to make their actions consistent with the intent and goals of "protection of wetlands," executive orders 89-10

[19] See *Tracy v. City of Mercer Island*, CPSGMHB No. 92-3-0001 (Final Decision & Order, January 5, 1993). *Pilchuck Audubon Society v. Snohomish County*, CPSGMHB No. 95-3-0047 (Final Decision & Order, December 6, 1995).

[20] See *Clark County Natural Resources Council v. Clark County*, WWGMHB No. 92-2-0001 (Final Order, November 10, 1992); *Save Our Butte Save Our Basin Society v. Chelan County*, EWGMHB No. 94-1-0015 (Final Decision & Order, August 8, 1994); *Confederated Tribes & Bands of the Yakama Indian Nation v. Yakima County*, EWGMHB No. 94-1-0021 (Final Decision & Order, March 10, 1995).

[21] See WAC 365-190-080(1).

and 90-04 as they exist on September 1, 1990. Additionally, counties and cities should consider wetlands protection guidance provided by the Washington State Department of Ecology (Ecology).

Counties and cities that do not now rate wetlands should consider a wetlands rating system to reflect the relative function, value, and uniqueness of wetlands in their jurisdictions. In developing wetlands rating systems, counties and cities should consider the following:

- The Washington state four-tier wetlands rating system;
- Wetlands functions and values;
- Degree of sensitivity to disturbance;
- Rarity; and
- Ability to compensate for destruction or degradation.

If a county or city chooses not to use the state four-tier wetlands rating system, the rationale for that decision needs to be included in its legal record.

Counties and cities may use the National Wetlands Inventory as an information source for determining the approximate distribution and extent of wetlands. This inventory provides maps of wetland areas according to the definition of wetlands issued by the U.S. Department of Interior Fish and Wildlife Service. For purposes of wetland boundary delineation, regulations should be consistent with the requirement in RCW 36.70A.175 to use the *Washington State Wetlands Identification and Delineation Manual* adopted by Ecology (Ecology Publication #96-94).

For additional information about marine and estuarine shoreline wetland modification issues, the following publication is recommended: Williams, Gregory D. and R.M. Thom, *Marine and Estuarine Shoreline Modification Issues*, Battelle Marine Sciences Laboratory, April 2001.

This document can be found at: http://wdfw.wa.gov/hab/ahg/marnrsrc.htm.

Designating Critical Aquifer Recharge Areas[22]

Water is an essential life-sustaining element. Much of Washington's drinking water comes from ground water supplies. Once ground water is contaminated it is difficult, costly, and sometimes impossible to clean up. Preventing contamination is necessary to avoid exorbitant costs, hardships, and potential physical harm to people.

The quality of ground water in an aquifer is inextricably linked to its recharge area. Where aquifers and their recharge areas have been studied, counties and cities should use this information as the basis for classifying and designating critical aquifer recharge areas. Where no specific hydrogeologic studies have been done, counties and cities may use existing soil, surficial geologic, and well log information to determine where recharge areas are likely to be located.

The risk of ground water contamination depends on two main sets of conditions. One set of conditions relates to the ground itself and how easy it is for water to pass through to ground water. If soils and the underlying ground are very permeable and the ground water table is shallow, then the hydrogeologic conditions are susceptible to contamination. In addition, a source of recharge, like rain or irrigation, must be present before contaminants would be carried down to the water table. This is what is meant by hydrogeologic susceptibility.

[22] See WAC 365-190-080(2).

The other set of conditions relates to how likely it is for potential contaminants to reach ground water. The amount of potential contaminant material, chemical composition, and how the material is handled all contribute to how easily potential contaminants may reach ground water. This is commonly known as **contamination loading potential** or source loading. To determine the threat to ground water quality, existing land use activities and their potential to lead to contamination should be evaluated.

Hydrogeologic susceptibility provides the basis for classifying critical aquifer recharge areas in terms of relative risk of contamination. Evaluation of potential contaminant loading provides information for policy, planning, management, and regulation of land uses that pose a risk to highly susceptible areas so that contamination can be prevented.

Vulnerability is the combined effect of hydrogeological susceptibility to contamination and the contamination loading potential. Vulnerability represents the risk that an aquifer could become contaminated by potential sources of pollution.

The following outlines several aspects important for designating critical aquifer recharge areas:

Characterize Hydrogeologic Susceptibility

The following parameters are found by using techniques hydrogeologists use. Depth to ground water is the main factor used in contamination risk assessment as far as critical aquifer recharge area analysis is concerned. The other factors are helpful in understanding the hydrogeologic system. These parameters help with understanding where ground water is, where it comes from, where it moves to, and how much there is. Beyond estimating contaminant risk, knowing ground water occurrence and movement helps in the management of water resources.

- Location
  - Aquifers.
  - Water wells.
  - Streams, springs, and lakes that depend on ground water recharge or that recharge.
- Characteristics of the subsurface
  - Soil cover.
  - Vadose zone.
  - Aquifer.
- Occurrence and movement of ground water
  - Depth to ground water.
  - Ground water flow direction.
  - Rate of ground water flow.
  - Rate of recharge/discharge.
  - Yield potential.
- Discharge zones and recharge zones

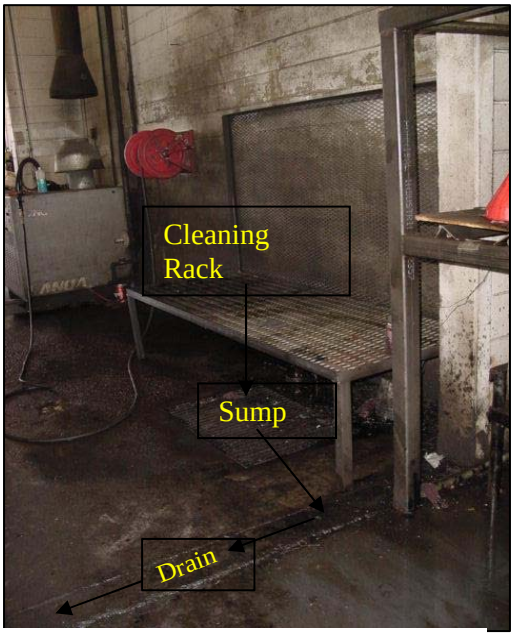
Evaluate Potential Contaminant Loading Risk Factors

- Amount of material.
- Chemical properties.
- Handling and use.

U.S. EPA Region 10

- Storage.
- Conveyance or transfer.

U.S. EPA Region 10



U.S. EPA Region 10

Example Land Uses That Typically May Have Contamination Potential

Ground water contamination can begin from industrial, agricultural, and residential land use. Industrial chemicals, pesticides, fertilizer, illegal oil dumping, septic tanks, and leaky sewer pipes all can cause ground water contamination. A *partial* list of typical contamination sources follows:

- Landfills.
- Agricultural activities that do not incorporate best management practices.
- Industrial facilities with heavy chemical use.
- Underground storage tanks.
- Above-ground storage tanks.
- Commercial facilities that use solvents.
- Electroplating facilities.

Example Tools That Help in Evaluating, Classifying, and Designating Critical Aquifer Recharge Areas

Here is a partial list of helpful information sources and tools for critical aquifer recharge area analysis:

- Professional expertise.
- Well logs.
- Soil surveys and maps.
- USGS topographic maps.
- Geologic studies and maps.

- Hydrogeologic studies and maps.
- Site reports – permitted sites, cleanup sites, civil engineering sites.
- Water level measurement.
- Water quality sampling.
- Models.
- Contaminant inventories.
- Well head protection/Source water protection.

Other Ground Water Protection Programs

Critical aquifer recharge area planning and the associated ordinances may take into consideration existing ground water protection programs such as:

- **Sole source aquifer recharge areas** designated pursuant to the federal Safe Drinking Water Act.
- **Ground water management areas** established for special protection pursuant to a ground water management program, Chapters 90.44, 90.48, and 90.54 RCW, and Chapters 173-100 and 173-200 WAC.
- **Source water/well head protection areas** designated pursuant to the federal Safe Drinking Water Act and state requirements.

Salt Water Intrusion in Coastal Fresh Water Aquifers

Salt water intrusion, or encroachment, is defined as the migration of salt water into fresh water aquifers under the influence of ground water development.[23] Salt water intrusion becomes a problem in coastal areas where fresh water aquifers are hydraulically connected with seawater. When large amounts of fresh water are withdrawn from these aquifers, hydraulic gradients encourage the flow of seawater toward the pumped well or wells. Whether or how fast this may occur depends on several factors, including the nature of the aquifer, the amount of precipitation recharging the aquifer, and the amount of ground water used. Seawater intrusion can and has occurred in various coastal and island communities in Washington state. Seawater intrusion into potable water aquifers could affect any of at least 13 counties in Puget Sound and the Washington coast.

As popular shoreline areas are increasingly developed, the limits to relying on ground water for potable water supply may be reached. Saltwater intrusion can be an intractable problem to solve once it has occurred. A commonly proposed solution in some shoreline areas is to provide a public water supply where salt water intrusion is suspected. In the absence of a reliable public water supply, setting reasonable limits to shoreline development may be needed. If the jurisdiction has designated the area as a critical aquifer recharge area, then delineation of the boundaries based on locally developed geologic and hydrological information will be a useful tool in developing strategies and determining future land use designations and densities.

It should be understood that providing a public water supply may not be a complete planning solution. Other development impacts, such as wastewater disposal, vegetation removal, and stormwater runoff can also degrade the shoreline environment and potentially can threaten the potable water aquifer serving existing residences. Thus, while this problem primarily involves potential impacts of ongoing population growth on ground water supply limits, it can also be just one part of a planning problem that requires addressing fundamental planning issues, such as

[23] See Freeze, S. F. and J. A. Cherry, *Groundwater*. Prentice Hall, Inc. 1979.

appropriate rural shoreline population density, rural area service delivery, and critical areas protection.

How can it be controlled? The first step in correcting problems with salt water intrusion is to evaluate the size and extent of the problem. This is commonly accomplished by the installation of monitoring wells, which are used to determine the boundaries of the salt/fresh water interface and the rate at which salinity levels are increasing. Monitoring data and other information on the hydrologic and geologic properties is often incorporated into problem analysis in order to predict future conditions and to evaluate remediation alternatives.

Possible approaches for local governments to consider include adopting rules that control the development of new water wells based on analyses of existing nearby water well chemistry, known aquifer sensitivity, or water supply limits. Such options to consider include:

- Prohibit new wells.
- Require water quality and quantity monitoring in areas suspected of high salinity.
- Reduce pumping (metering withdrawal will be a useful tool to monitor results).
- Relocate wells.
- Directly recharge aquifer (primarily surficial aquifers).
- Recharge fresh water into wells paralleling the coast, creating a hydrodynamic barrier.
- Extract seawater before it reaches wells.
- Establish seasonal or periodic water use restrictions.
- Prepare scientific hydrogeologic reports to support new well development.

Designating Frequently Flooded Areas[24]

Floodplains and other areas subject to flooding perform important hydrologic functions and may present a risk to persons and property. Classifications of frequently flooded areas should include, at a minimum, the 100-year floodplain designations of the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program.

Historic losses to salmon habitat have occurred as a result of development encroaching into floodplains. Restricting floodplain development can minimize adverse effects to human health and infrastructure. Floodplains are also ideal locations for salmon habitat restoration. While floodplains are potentially hazardous areas for development due to flooding and erosion, fish and wildlife depend on the habitat created when a river is allowed to migrate and overflow its banks. Natural floodplains, channel migration zones, and associated riparian wetlands are critical components of a properly functioning aquatic ecosystem.

Counties and cities should consider the following when designating and classifying frequently flooded areas:

- Effects of flooding on human health and safety and on public facilities and services.
- Available documentation including federal, state, and local laws, regulations, and programs, local studies and maps, and federal flood insurance programs.
- The future flow floodplain, defined as the channel of the stream and that portion of the adjoining floodplain that is necessary to contain and discharge the base flood flow at build out without any measurable increase in flood heights.
- The potential effects of tsunami, high tides with strong winds, sea level rise resulting from global climate change, and greater surface runoff caused by increasing impervious surfaces.

[24] See WAC 365-190-080(3).

FEMA maps, called Flood Insurance Rate Maps (FIRM) and Flood Boundary/Floodway Maps, have been prepared for every flood-prone community in the state. They are the basic critical areas designation tools for frequently flooded areas. However, community officials should also use newer or more refined data wherever it is available. This includes data on channel migration, maps showing build-out conditions, riparian habitat areas, etc. Where flood boundaries have been provided on the FEMA maps but flood elevation data has not been provided, the local floodplain administrator is required to obtain and use elevation data that is available from another authoritative source.[25] Any information that is used other than the FEMA information, however, cannot be used if it is less restrictive than the FEMA data. That is, the FEMA data must always be used as the minimum data required.

Ecology offers coastal data at:
http://www.ecy.wa.gov/programs/sea/SMA/atlas_home.html.

Designating Geologically Hazardous Areas[26]

Geologically hazardous areas include areas susceptible to erosion, sliding, earthquake, or other geological events. They pose a threat to the health and safety of citizens when incompatible commercial, residential, or industrial development is sited in areas of significant hazard. Geologically hazardous areas also have an important function in maintaining habitat integrity. Mass wasting events, such as landslides and debris flows, contribute needed sediment and wood for building complex instream habitats, estuarine marshes, and beaches important for fisheries, wildlife, and recreation. At the same time, mass wasting events can harm habitat and lead to the need for stream restoration.

Some geological hazards can be reduced or mitigated by engineering, design, or modified construction or mining practices so that risks to health and safety are acceptable. When technology cannot reduce risks to acceptable levels, building in geologically hazardous areas is best avoided. This distinction should be considered by counties and cities that do not now classify geological hazards as they develop their classification scheme.

Areas that are susceptible to one or more of the following types of hazards should be classified as a geologically hazardous area:

- Erosion hazard (including river and coastal streambank erosion areas and channel migration areas).
- Landslide hazard.
- Seismic hazard.
- Areas subject to other geological events such as coal mine hazards and volcanic hazards including: mass wasting, debris flows, rock falls, and differential settlement.

Counties and cities should consider classifying geologically hazardous areas as either known or suspected risk, no risk, or risk unknown where data are not available to determine the presence or absence of a geological hazard.

Erosion Hazard Areas

Geologically hazardous erosion, such as those areas with high probability of coastal erosion or streambank erosion as well as channel migration areas, should be designated as critical areas.

[25] This is a flood protection requirement, not a GMA requirement.
[26] See WAC 365-190-080(4).

Erosion hazard areas may also include those areas identified by the U.S. Department of Agriculture Natural Resources Conservation Service as having a "severe" rill (a rill is a long narrow trench or valley) and inter-rill erosion hazard.

Landslide Hazard Areas

Landslide hazard areas are potentially subject to landslides based on a combination of geologic, topographic, and hydrologic factors. Landslide hazard areas include any areas susceptible because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors. Local governments are encouraged to consult with a licensed geologist when designating these areas and determining the regulations necessary to ensure safe development practices or restrictions.

Examples of these areas may include, but are not limited to the following:

- Areas of historic failures, such as those areas delineated by the U.S. Department of Agriculture Natural Resources Conservation Service as having a "severe" limitation for building site development; those areas mapped as class u (unstable), uos (unstable old slides), and urs (unstable recent slides) in the Washington State Department of Ecology Coastal Zone Atlas; or areas designated as quaternary slumps, earth flows, mudflows, lahars, or landslides on maps published by the U.S. Geological Survey or Washington State Department of Natural Resources Division of Geology and Earth Resources.
- Areas with all three of the following characteristics:
    - Slopes steeper than 15 percent.
    - Hillsides intersecting geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock.
    - Springs or ground water seepage.
- Areas that have shown movement during the Holocene epoch (from 10,000 years ago to the present) or which are underlain or covered by mass wastage debris of that epoch.
- Slopes that are parallel or subparallel to planes of weakness (such as bedding planes, joint systems, and fault planes) in subsurface materials.
- Slopes having gradients steeper than 80 percent subject to rockfall during seismic shaking.
- Areas potentially unstable as a result of rapid stream incision, stream bank erosion, and undercutting by wave action.
- Areas that show evidence of, or are at risk from, snow avalanches.
- Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris flows or catastrophic flooding.
- Any area with a slope of 40 percent or steeper and with a vertical relief of ten or more feet except areas composed of consolidated rock. A slope is delineated by establishing its toe and top and measured by averaging the inclination over at least ten feet of vertical relief.

Seismic Hazard Areas

Seismic hazard areas include areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement, soil liquefaction, or surface faulting. One indicator of potential for future earthquake damage is a record of earthquake damage in the past. In Washington, ground shaking is the primary cause of earthquake damage and the strength of ground shaking is primarily affected by:

- The magnitude of an earthquake.
- The distance from the source of an earthquake.
- The type of thickness of geologic materials at the surface.
- The type of subsurface geologic structure.

Settlement and soil liquefaction conditions occur in areas underlain by cohesionless soils of low density, typically in association with a shallow ground water table. (See *Citations of Recommended Sources of Best Available Science*, pp. 24-26.)

Other Geologic Hazard Areas

Volcanic hazard areas include areas subject to pyroclastic flows, lava flows, debris avalanche, and inundation by debris flows, mudflows, or related flooding resulting from volcanic activity.

Mine hazard areas are those areas underlain by, adjacent to, or affected by mine workings such as adits, gangways, tunnels, drifts, or airshafts. Factors that should be considered include: proximity to development, depth from ground surface to the mine working, and geologic material. (See *Citations of Recommended Sources of Best Available Science*, p. 26.) Other areas may also be subject to geologic events and associated hazards, such as rock falls, tsunamis, coastal bluff erosion, wave action, and differential settlement.

Designating Fish and Wildlife Habitat Conservation Areas[27]

Paul Inghram

The GMA requires cities and counties across the state to address land use issues that directly and indirectly impact fish and wildlife habitat. Fish and wildlife habitat conservation is the management of land for maintaining species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created. This does not mean that all individuals of all species must be maintained at all times, but it does mean cooperative and coordinated land use planning is critically important among counties and cities in a region. In some cases, intergovernmental cooperation and coordination may show that it is sufficient to ensure that a species will usually be found in counties and cities in a region. In some cases, the designation of fish and wildlife habitat conservation areas should include:

- Areas with which endangered, threatened, and sensitive species have a primary association.
- Habitats and species of local importance.
- Commercial and recreational shellfish areas.
- Kelp and eelgrass beds.
- Mudflats and marshes.
- Herring, surf smelt, and sand lance-spawning areas.
- Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat.
- Waters of the state.
- Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity.
- State natural area preserves and natural resource conservation areas.

[27] See WAC 365-190-080(5).

- Areas critical for habitat connectivity, which can include open space corridors designated in comprehensive plans under RCW 36.70A.160.

The following may be considered when classifying and designating these areas:

- Creating a system of fish and wildlife habitat with connections between larger habitat blocks and open spaces.
- Providing for some level of human activity in such areas including presence of roads and level of recreation type (passive or active recreation may be appropriate for certain areas and habitats).
- Protecting riparian ecosystems.
- Evaluating land uses surrounding ponds and fish and wildlife habitat areas that may negatively impact these areas.
- Establishing buffer zones around these areas to separate incompatible uses from the habitat areas.
- Restoring lost salmonid habitat.

Counties and cities should classify seasonal ranges and habitat elements with which federal and state listed endangered, threatened, and sensitive species have a primary association and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term. See Appendix D for a listing of federal and state Threatened, Endangered, and Candidate Species. Counties and cities should also determine which habitats and species are of local importance. See Section X.60.010(A)(3) in the Example Code Provisions for one method of designating habitats of local importance. Habitats and species may be further classified in terms of their relative importance.

Information is available from the Washington Department of Fish and Wildlife that may help classify and designate locally important habitats and species. See Appendix E for a list of State Listed Priority Habitats. Priority habitats and priority species are being identified by the Department of Fish and Wildlife for all lands in Washington state. While these priorities are those of the department, the priorities and the data on which these areas are based may be considered by counties and cities.

Recent scientific studies point to the importance of the size and shape of habitat areas for providing adequate space for critical habitat functions, with larger, rounder shapes more preferred over smaller or linear shapes. Narrow, linear shapes tend to be dominated by edges that allow increased external impacts to sensitive species from wind, light, and predation. Corridors for connections between larger habitat areas may be extremely important to allow upland species to access needed seasonal ranges and to prevent isolation of small subpopulations.

Shellfish Areas

Shellfish areas include all public and private tidelands or bedlands suitable for shellfish harvest. Counties and cities should consider both commercial and recreational shellfish areas. The Washington State Department of Health classification of commercial and recreational shellfish growing areas may help determine the existing condition of these areas. Further consideration should be given to the vulnerability of these areas to contamination. Shellfish protection districts established pursuant to Chapter 90.72 RCW must be included in the classification of critical shellfish areas.

Kelp and Eelgrass Beds and Herring and Smelt Spawning Areas

Kelp and eelgrass beds have been identified by the Washington State Department of Natural Resources Aquatic Lands Division and the Washington State Department of Ecology. Though not an inclusive inventory, locations of kelp and eelgrass beds are compiled in the *Puget Sound Environmental Atlas, Volumes 1 and 2.* Herring and smelt spawning locations are outlined in WAC 220-110-250 and the *Puget Sound Environmental Atlas.* Prohibited work times in saltwater areas are listed in WAC 220-110-271.

Naturally Occurring Ponds

Naturally occurring ponds do not include ponds deliberately designed and created from dry sites, such as canals, detention facilities, wastewater treatment facilities, farmponds, temporary construction ponds (of less than three years duration), and landscape amenities. However, naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority.

Waters of the State

Waters of the state are defined in Title 222 WAC, the forest practices rules and regulations. Counties and cities should use the classification system established in WAC 222-16-030 or 222-16-031 and may consider the following factors when classifying waters of the state as fish and wildlife habitats:

- Species present which are endangered, threatened, or sensitive and other species of concern.
- Species present which are sensitive to habitat manipulation.
- Historic presence of species of local concern.
- Existing surrounding land uses that are incompatible with salmonid habitat.
- Presence and size of riparian ecosystems.
- Existing water rights.
- The intermittent nature of some of the higher classes of waters of the state.

State's Water Typing System to Change

Changes are coming to Washington Department of Natural Resources' (DNR) water typing system. Within the rules, WAC 222-16-030 defines a water typing system that is used for regulating forest practices on state and private forestlands. Data from this water typing system will continue to be available on a statewide basis, including non-forestland.

The water typing classification will change from a numbering code to a new lettering system. DNR is moving from water types 1 through 5 to a statewide map delineating the waters of the state into three categories: Type S waters, Type F waters, and Type Np and Ns waters. The new type "S" or shoreline designation will be based on data provided by the Washington State Department of Ecology. The new "F" or fish habitat will be created from a multiparameter, field verified geographic information system (GIS) logistic regression model. Types "Np" and "Ns" are non-fish habitat that either has water flowing year around or has dry periods respectively.

The new water type map will provide codes for streams on a statewide basis, but under the current regulatory authorities, and funding maintenance and updates will be focused only on state and private forestlands. Once the new water typing codes are implemented, the old numeric

codes will no longer be maintained. A conversion table (see next page) is provided in rule to help implement this change in the water typing system.

Water Type Conversion Table

Permanent Water Typing	Interim Water Typing
Type “S”	Type 1 Water
Type “F”	Type 2 & 3 Water
Type “Np”	Type 4 Water
Type “Ns”	Type 5 Water

For a copy of the complete Forest Practices Rules, visit DNR’s Internet Web site at: http://www.dnr.wa.gov/forestpractices/rules/.

Lakes, Ponds, Streams, and Rivers Planted With Game Fish

This includes game fish planted in these water bodies under the auspices of a federal, state, or local government, or tribal program.

State Natural Area Preserves and Natural Resource Conservation Areas

Natural area preserves and natural resource conservation areas are defined, established, and managed by the Washington State Department of Natural Resources.

For criteria to assess the wildlife habitat potential of an urban area, please refer to page 47.

VII. Protecting Critical Areas

Regulatory and Nonregulatory Options

Regulations are just one tool used in protecting the many functions of critical areas. Along with regulations, there are many nonregulatory tools important to critical areas protection, including voluntary stewardship actions taken by landowners, private groups, and the community. A complete critical areas program should educate and inform the public about the value of critical areas protection and assist them with understanding best management practices on their property.

Critical Areas Regulations

The GMA requires all counties and cities in Washington to adopt development regulations to protect designated critical areas.[28] The Western Washington Growth Management Hearings Board has described the GMA as imposing a duty on local governments to adopt development regulations that protect critical areas. Inherent in that duty is the requirement that the regulations contain appropriate and specific criteria and standards to ensure protection.[29] To meet this requirement, many communities have chosen to adopt stand-alone regulations to address critical areas. Often, such regulations are a "Critical Areas Chapter" within the code's development regulations title. This handbook focuses on developing critical areas regulations. However, critical areas may also be protected using other development regulations, the State Environmental Policy Act (SEPA) environmental review process, and nonregulatory programs.

Other Development Regulations

Critical areas regulations should be complementary to other local regulations, ordinances, and plans. To provide appropriate protection to critical areas, all other local land use regulations should be reviewed and updated to be consistent with the goals of the local critical areas program. Consistency between policies and regulations should be reviewed for shoreline master programs; surface and ground water management regulations; clearing and grading regulations; zoning codes; subdivision codes; and locally adopted best management practices. It is also recommended that jurisdictions review and consider revising the following codes and standards to ensure consistency and critical area protection:

[28] See RCW 36.70A.060(2).

[29] See *Whatcom Environmental Council v. Whatcom County*, WWGMHB No. 95-2-0071 (Final Decision & Order, December 20, 1995); *Willapa Grays Harbor Oyster Growers Association v. Pacific County*, WWGMHB No. 99-2-0019 (Final Decision & Order, October 28, 1999).

Regulation or Standard	Check
Clearing and Grading	Standards should be adopted to regulate clearing and grading activities prior to site development approval. An option can be included to limit the percent of a site that can be cleared in keeping with low impact development site planning. Clearing and grading exemptions should not include project areas located within critical areas or buffers, even when the proposed alteration is for less than fifty (50) cubic yards. Please see WAC 197-11-800 (1).
Stormwater Management	Stormwater management regulations that are consistent with the Ecology recommendations should be adopted. The *Puget Sound Water Quality Management Plan* calls on all Puget Sound jurisdictions to adopt comprehensive stormwater management programs. Stormwater regulations may incorporate adaptive management provisions to address cumulative increases to total impervious area and forest cover thresholds at the sub-basin scale.
Shoreline Master Program (SMP)	Shoreline Environment designations and development standards to protect shorelines under the locally adopted SMP should be consistent with provisions to protect critical areas.[30]
State Environmental Policy Act (SEPA)	It is recommended that locally adopted categorical exemptions from SEPA provide that these exemptions do not apply in designated critical areas pursuant to WAC 197-11-908. Also see WAC 197-11-158. SEPA review procedures should rely first on critical areas review requirements to address environmental impacts. Local governments are encouraged to complete review under the critical areas regulations prior to making a threshold determination. Counties and cities may then make a determination that some or all of the environmental impacts of a project have been adequately addressed by critical areas regulations.[31] SEPA and critical area review procedures should be evaluated to ensure project and environmental review procedures are integrated and not duplicative.[32]
Local Development Review	Project noticing rules should be updated so that a statement regarding critical areas is included on the Notice of Application, thereby communicating to the public whether or not critical areas have been determined to be present and how they will be protected.

[30] For more information on protecting critical areas in shorelines of the state, see page 42.
[31] See RCW 43.21C.240 and WAC 197-11-158.
[32] See RCW 36.70B.060.

Each city and county should review its portfolio of regulations and rules for consistency with critical areas protection measures. The standards required to protect critical areas may be thwarted by out-of-date standards or exemptions in other code sections. For example, if clearing and grading is sometimes allowed without a permit, such regulations may not be fully protecting critical areas and therefore would be inconsistent with the mandate of the GMA.

To ensure that other regulations do not conflict with adopted critical areas standards, local codes may include a provision that has the stronger regulation apply, such as a statement like the following:

> When any provision of this Title or any existing regulation, easement, covenant, or deed restriction conflicts with these critical areas regulations, that which provides more protection to the critical areas shall apply.

Drafting and Adopting Regulations

The following sections discuss methods of drafting and adopting critical areas regulations, key regulatory components, and parts of the process that are required by the GMA and looked for by the Washington State Department of Community, Trade and Economic Development (CTED) during its review. The process of drafting and adopting local critical areas regulations should follow the process required for adopting all land use development regulations under the GMA, including public participation, public hearings, agency review, and adoption. The adoption of critical areas regulations must meet the minimum requirements of RCW 36.70A.060, 36.70A.170, and 36.70A.172 and the Minimum Guidelines adopted by CTED found in WAC 365-190-080.

State Agency Review

As part of the state review of communities' comprehensive plans and development regulations, state agencies review and comment on proposed critical areas regulations. At least 60 days prior to legislative adoption, new or amended comprehensive plans and development regulations must be submitted to CTED and other state agencies for review.[33] The submittal of a draft critical area ordinance (or any comprehensive plan amendment or development regulation) for the official 60-day review should clearly state that the submittal is for this review and include a contact name and a copy of the draft proposal. As other state agencies may also review this draft, submitting copies of the draft to them at the same time helps to expedite the process.

In addition to the 60-day review process, state agencies are available to provide local communities with guidance drafting and reviewing regulations. CTED can also provide assistance with issues related to meeting the requirements of the GMA.

> For assistance in locating state agency resources, contact Growth Management Services of CTED at 360-725-3000. www.cted.wa.gov/growth

Local jurisdictions are encouraged to contact CTED and other agencies early in the process of updating their critical areas regulations. In this way, any new information can be provided that will assist in the identification of critical areas boundaries as well as providing the most recent

[33] See RCW 36.70A.106.

references to the best available science for the specific critical area issue. State agency staff can also provide assistance in developing strategies that address the needs of an individual community.

Public Involvement

The public should be involved early in the process of developing critical areas regulations. At a minimum, cities and counties should attempt to include landowners, representatives of agriculture, forestry, mining, business, environmental, and community groups; tribal governments; representatives of adjacent counties and cities; and state agencies. A public participation program should include early and timely public notice of pending designations and regulations.[34]

Rita R. Robison

Counties and cities should consider using technical and citizen advisory committees with broad representation, press releases, news conferences, workshops, neighborhood meetings, paid advertising (e.g., newspaper, radio, TV, transit), newsletters, and other means beyond the required normal legal advertising and public notices. Plain, understandable language should be used.

CTED staff are also available to provide technical assistance in preparing public participation plans, including: a pamphlet series, workshops, and a list of agencies available to provide help.

Intergovernmental Coordination

The GMA requires coordination among communities and jurisdictions with common borders or related regional issues to reconcile conflicts and strive for consistent definitions, standards, and designations within regions.[35] This coordination process may include these two options:

1. Adjacent cities (or those with overlapping or adjacent planning areas); counties and the cities within them; and adjacent counties would provide each other and all adjacent special purpose districts and special purpose districts within them notice of their intent to classify and designate natural resource lands and critical areas within their jurisdiction. Counties or cities receiving notice may provide comments and input to the notifying jurisdiction. The notifying jurisdiction specifies a comment period prior to adoption. Within 45 days of the jurisdiction's date of adoption of classifications or designations, affected jurisdictions are supplied a copy of the proposal. CTED can provide a list of mediation services to counties and cities to help resolve planning issue disputes.
2. Adjacent jurisdictions; all the cities within a county; or all the cities and several counties may choose to cooperatively classify and designate critical areas within their jurisdictions. Counties and cities by interlocal agreement would identify the definitions, classification, designation, and process that will be used to classify and designate lands within their areas.

[34] See RCW 36.70A.140.
[35] See RCW 36.70A.100.

State and federal agencies or tribes may participate in the interlocal agreement or be provided a method of commenting on designations and classifications prior to adoption by jurisdictions.

Counties and/or cities may choose to change to the interlocal agreement method prior to completion of the classification and designations within their jurisdictions. It is intended that state and federal agencies with land ownership or management responsibilities, special purpose districts, and tribal governments with interests within the jurisdictions adopting critical area regulations be consulted and their input considered in the development and adoption of designations, classifications, and protection programs. CTED can provide a list of mediation services to help resolve disputes between counties and cities that are using either the notification or interlocal agreement method of coordinating between jurisdictions.

Code Organization

There are three basic organizational techniques for critical areas regulations:

- Integrate all critical areas regulations into the zoning, subdivision, and other relevant code sections.
- Have an individual chapter for critical areas performance measures, while integrating all administrative and procedural code with other development regulations.
- Have an independent critical areas chapter or ordinance that includes both performance measures and administrative procedures that operate independently.

A fourth option would be to use a combination of the above. For example, a community may choose to have a stand-alone chapter for flood hazard regulation while integrating aquifer recharge area standards into their general development regulations.

The Example Code Provisions are formatted as a stand-alone critical areas chapter. This is due to it being a generic code that could be used anywhere in the state, and not to imply that this is the best organizational structure. In fact, if a community chooses to base its critical areas regulations on the Example Code Provisions, they should consider the best method of integrating the code language into the jurisdiction's existing development regulations to avoid confusion, redundancies, and conflicts.

Integration with Development Regulations and SEPA

Regulations to protect critical areas often overlap with other environmental regulations, such as Shoreline Master Program regulations, clearing and grading regulations, and other development regulations. At times, regulations to protect critical areas may be superseded by more stringent zoning requirements. It is a good idea when reviewing and updating the critical areas ordinance that it cross-reference these other regulations or permit requirements. When a local government is using its SEPA determination function for programmatic or project SEPA review, identify how these other regulations will be applied and conditioned to reflect the "protection of function" goal. Cities and counties are encouraged to select certain categorized exemptions that do not apply in one or more critical areas pursuant to WAC 197-11-908. SEPA review procedures should require critical areas delineation and review prior to making a threshold determination. SEPA and critical area review procedures should be evaluated to ensure consistent project review procedures. For more discussion about SEPA and the GMA, refer to page 43.

When to Require Critical Areas Review

The code needs to specify when and where critical areas regulations are applicable. If the critical areas regulations are integrated into existing development regulations, they may apply "automatically" to any new development similar to the manner that setbacks apply. However, if the critical areas regulations are located separately from the development regulations, such as in critical areas chapter, the critical areas code needs to specify its applicability.

There are two basic options: (1) use code language that states that critical areas regulations are applicable to all development, or (2) specify the types of development and locations regulated by the critical areas code. In either case, critical areas regulations should always apply whenever necessary to protect the critical areas from development activity. The first option, to have them always apply, cuts out the step (and relevant code language) of determining whether they apply or not. If the critical areas regulations always apply, then the review process needs to be simple enough that common permits are not unduly delayed. Limiting applicability to only specific uses or mapped locations eliminates the review process for many applicants, but it is dependent on having sufficient information to precisely identify critical areas at the time the regulations are adopted.

The following is an example of code language that could be used to state applicability of the critical areas ordinance:

> The [city/county] shall regulate all uses, activities, and developments within, adjacent to, or likely to affect, one or more critical areas, consistent with the best available science and the provisions [in the critical areas chapter].

Paul Inghram

The examples states applicability broadly, including all "uses, activities, and developments" and it specifies that it applies whenever such activity is "likely to affect" a critical area.

What Activities Require Review?

While development regulations typically apply to new construction activities, the code language for critical areas needs to be broad enough that it protects critical areas from all development activities, including those that do not involve new structures, such as roads. Clearing, paving, new uses (such as outdoor stages), and even storage of equipment (such as those with hazardous chemicals) need to be regulated to ensure protection. Depending on how performance measures are implemented, exemptions may need to be stated so that minor passive land use activities, such as passive recreational uses, are not subject to review.

Some existing and ongoing business practices that are nonconforming may also be regulated requiring annual reporting to the jurisdiction about operational performance, storage of hazardous materials, etc. Annual inspection programs by the jurisdiction may be another function that should be considered, especially if the nonconforming use represents a potential risk to a critical area protection. An example of this would be those businesses that conduct activities that handle hazardous substances or waste and that are located within a critical aquifer recharge area.

When Is an Impact Likely?

The critical areas code should state that review is required whenever the proposed development is near a critical area or whenever an impact is likely. Some codes fail to fully protect critical areas by limiting review to the following scenarios:

"When a critical area is located on site." – This ignores a potential critical area that might be located on the adjacent property or in the right-of-way that may be strongly affected by the proposed development.

"When the development is located within a critical area." – This protects critical areas in the most extreme cases, but fails to protect when the development is within the buffer or immediately adjacent to the critical area. Some communities have partially addressed this issue by including the buffer in the language, "when the development is located within a critical area or its buffer." However, often the buffer distance is not known, some critical areas do not have buffer set back requirements, and some developments will still result in significant impacts even when located beyond the buffer area. The light, noise, and smoke from an industrial facility may have a significant impact on habitat even though it may be located beyond the buffer area.

To fully protect critical areas, the code language should include a statement that the community shall regulate development that is "likely to affect" a critical area.

Implementation of "likely to affect," however, would be difficult without knowing what typical impact distances are. To make the code more meaningful for both the staff and the public, it may be appropriate to include either a standard distance that includes all anticipated building activity set back distances or a list of variable buffer distances that apply depending on the type of critical areas identified. This first option could be implemented with the following language:

The [city/county] shall regulate all uses within [____ feet] of, or that are likely to affect, one or more critical areas, consistent with the best available science and the provisions herein.

Alternatively, the community could specify a list of distances based on the critical areas known to exist in their environment:

The [city/county] shall regulate all uses, activities, and developments within, adjacent to, or likely to affect, one or more critical areas, consistent with the best available science and the provisions herein. Adjacent shall mean any activity located:

1. On a site immediately adjoining a critical area;
2. A distance equal to or less than the required critical area buffer width and building setback;
3. A distance equal to or less than one-half mile (2,640 feet) from a bald eagle nest; [36]

[36] The distance of 2,640 feet is based on the Washington Department of Fish and Wildlife *Management Recommendations for Washington's Priority Species, Volume IV: Birds*.

4. A distance equal to or less than three hundred (300) feet upland from a stream, wetland, or water body; [37]
5. Within the floodway, floodplain or channel migration zone; or
6. A distance equal to or less than two hundred (200) feet from a critical aquifer recharge area. [38]

Using broad language here means that the critical areas regulations will apply in many situations ensuring that potentially impactful development does not escape review. However, the applicability of regulations does not mean that developments must go through a complex or lengthy review process. First, minor activities should be listed as exempt (see section on exemptions below). Additionally, a two-tiered review process may be used where a low level of review is used for common proposals that are likely to have only minor impacts and a higher level of review for larger projects and those with more direct impacts.

Exemptions, Exceptions, and Allowable Uses

As recommended above, to protect critical areas a community's critical areas regulations should apply broadly to any development activity that might result in a detrimental impact. However, there are several reasons why some activities should be exempt from critical areas regulations or why they should be allowed with a lower level of review:

- Regulations should not prevent emergency actions that reduce risks of natural hazards.
- Some activities are unlikely to result in an impact.
- Additional critical areas review may not be effective in some instances.
- Appropriate uses of land should be encouraged.
- Beneficial activities, such as restoration, should be encouraged.

Minor activities, such as bird watching, pose little threat to critical areas. Other activities may have already been reviewed for critical areas impacts or their potential critical areas impact may be limited by other regulations, such as stormwater regulations. The time and expense to review such activities would likely be excessive in comparison to the potential impact that minor activities might result in.

The Example Code Provisions includes sections for *exemptions, exceptions,* and *allowed uses*. These three categories allow varying degrees of allowed activities or uses either without review or in a way that avoids the regulations of the critical areas chapter. As presented in the Example Code Provisions, exemptions are "exempt" from the regulations contained in the critical areas chapter or ordinance. That is, the regulations do not apply and no review is required. Being an exempt activity does not give permission to degrade critical areas or ignore the risk of natural hazards. Exemptions listed in the Example Code Provisions are:

- Emergencies.
- Operation, maintenance, or repair.
- Passive outdoor activities.
- Forest practices regulated by the state.

[37] The distance of three hundred (300) feet is based on maximum recommended riparian habitat area width from the Washington Department of Fish and Wildlife *Management Recommendations for Washington's Priority Habitats: Riparian*.

[38] The distance of two hundred (200) feet is a suggested distance to ensure that activities within the critical aquifer recharge area are included under this Chapter, even when the exact boundaries of the critical aquifer recharge area are not known at the time of application.

Each of these exemptions is further defined in the Example Code Provisions.

"Allowed uses" are those activities that due to other regulations or previous reviews are unlikely to result in a critical areas impact. These activities are subject to review by the city or county, but do not require a separate critical areas review or report. Since these activities are not "exempt," the critical areas standards continue to apply and the underlying permit could be conditioned to ensure that the activity complies with critical areas protection. Some jurisdictions use the term "partial exemptions" to note that these activities are exempt from the critical areas review process, but not the protection standards. Allowed uses might include:

- Projects previously reviewed for critical areas impacts.
- Modification of existing structures.
- Activities within the improved right-of-way.
- Minor utility projects.
- Trails.
- Minor vegetation removal and the removal of hazard trees.
- Minor site investigation work.
- Navigational aids and boundary markers.

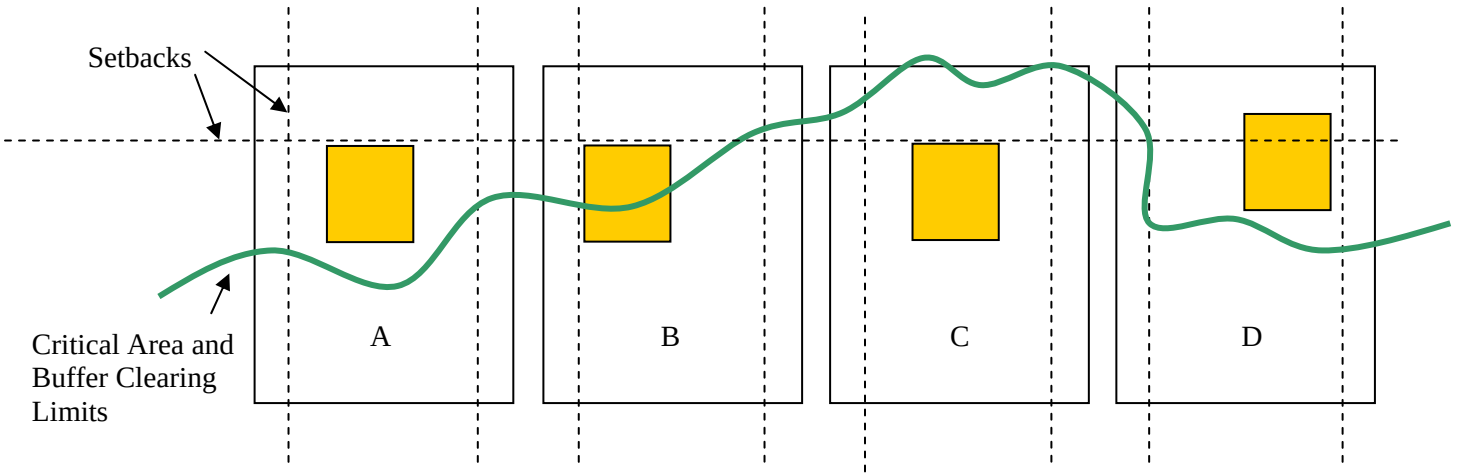
In addition to exemptions and allowed uses, cities and counties must allow a minimal "reasonable use" of property even if such a use would otherwise be denied by the critical areas regulations. The Fifth Amendment and Fourteenth Amendment of the U.S. Constitution provide individuals with protection from being deprived of the use of one's property without *due process* or *just compensation*.

If critical areas regulations denied all use of a parcel, it would typically be considered a "taking" of the property. If legally challenged and unjustified, a court could throw out the regulations, thereby jeopardizing environmental protection. To avoid a taking, cities and counties typically include a reasonable use provision that allows only the minimal "reasonable" use of a property for which otherwise development would be prohibited.

Reasonable Use Exception Permit

Unlike variances, the purpose of a reasonable use exception permit is not to allow general development within critical areas, but to only allow the minimal "reasonable" use of the property so as to avoid a constitutional taking. Section X.10.150 of the Example Code Provisions provides an example of a reasonable use exception that is a compilation of reasonable use processes in use by various jurisdictions.

Four scenarios are sketched on the next page that illustrate situations where a reasonable use exception might or might not be applicable:



Reasonable Use Scenarios

A – No reasonable use would be granted because there is sufficient space outside the critical area clearing limits.
B – A reasonable use permit might be granted since there is insufficient space for a reasonable use. The development area would need to be limited or scaled back in size and located where the impact is minimized.
C – A reasonable use permit would be granted for a minimal development if the property is completely encumbered and mitigation methods are applied.
D – The jurisdiction might consider modifications to the required setback to prevent intrusion into the protection area.

Criteria Consistent With Case Law and Defining Reasonable Use

The criteria for reasonable use permits needs to be consistent with case law to reduce the potential for appeals and overturned decisions. Key to being consistent with case law is careful use of the term "reasonable." Generally, the concept of "reasonable" is left to the courts to decide, thereby making it difficult for cities to rule on whether or not a project qualifies. A reasonable use is often thought to be a modest single-family home, although some other structure might be "reasonable" depending on zoning, adjacent uses, and the size of the property.

The reasonable use permit criteria should allow for "reasonable" uses. If the criteria state that the applicant must demonstrate that no other use "is possible," or that there are "no feasible alternatives," it would conflict with the concept of a "reasonable" use as other "possible" alternatives may be so costly as to be unreasonable. "Possible" alternatives may also not meet the objectives of the property owner. For example, continued preservation of habitat is a "possible" use of property, but probably not a "reasonable" use for the owner.

Submittal Requirements

To limit the need for comprehensive critical areas review, some jurisdictions may choose to implement a two-tiered review process. To facilitate a two-tiered process, the local jurisdiction would collect all readily available information about the project site to make an initial determination. An outline of information that might be requested as part of a critical areas review

is included in Appendix F (Critical Area Identification Form Outline). Often, a determination about the likelihood of impacts to a critical area can be determined with some basic information.

The critical areas identification form asks a series of questions about the subject property. The questions are designed to be completed by the property owner or applicant without the assistance of a technical professional. Combined with a site visit, GIS data, and aerial photography, the staff may be able to use the applicant's responses to determine whether critical areas are located nearby and whether the development is likely to result in an impact. This allows the staff to conduct a "low level" review without a lot of expense or delay. In locations where little existing information is available, the community may require the applicant to submit additional information about the site and proposal, such as site photographs.

Reviewing Multiple Critical Areas and Local Project Review

Where there are multiple critical areas that may be impacted by development, special efforts should be made to consider the cumulative effect of the permitting decision on the different critical areas. This information should be well documented using the SEPA process. If project mitigation is being considered that is not required by the critical areas regulation, then the SEPA documentation should identify the impacts and the decision process for avoiding or mitigating environmental impacts to the critical area(s). (See section on SEPA on page 43).

Analyzing consistency between the proposed project with the applicable development regulations is a requirement under RCW 36.70B.040 for those jurisdictions fully planning under the GMA. All local jurisdictions routinely review projects for consistency with applicable regulations. GMA counties and cities must, at a minimum, consider the following four factors found in their development regulations, or in the absence of applicable development regulations, the comprehensive plan policies:

- The type of land use allowed, such as the land use designation;
- The level of development allowed, such as units per acre or other measures of density;
- Infrastructure, such as the adequacy of public facilities and services to serve the proposed project; and
- The characteristics of the proposed development, measured by the degree to which the project conforms to specific development regulations or standards.

This uniform approach is based upon existing project review practices and should not place an additional burden on applicants or local government. Consistency analysis is largely a matter of code checking for most projects that are simple or routine. More complex projects, such as those that would impact more than one critical area, may require more analysis of these factors, including possible studies. (See CTED's Project Consistency Rules, WAC 365-197 for more information on consistency criteria and analysis). If the project is not consistent with the development regulations and comprehensive plan, the project can be conditioned to make it consistent, or denied.[39]

Qualified Professionals

A jurisdiction is encouraged to consult with a qualified professional or a team of professionals at an early stage of critical area assessment and in the development of sound management approaches. Professionals can assist the jurisdiction with identifying local critical areas, assemble and review the best science for understanding how the critical areas function, and

[39] See RCW 36.70B.030 and 040, and RCW 43.21C.240.

assist with developing management recommendations. In WAC 365-195-905, CTED defines the role of a qualified professional and what qualifies him or her for this role.

The scientific expert or experts may rely on their professional judgment based on experience and training, but they should use the criteria set out in WAC 365-195-900 through 925 and any technical guidance provided by agencies with expertise. Determining whether a person is a qualified scientific expert with expertise appropriate to the relevant critical areas is determined by the person's professional credentials and/or certification. In addition, any advanced degrees earned in the pertinent scientific discipline from a recognized university, the number of years of experience in the pertinent scientific discipline, recognized leadership in the discipline of interest, formal training in the specific area of expertise, and field and/or laboratory experience with evidence of the ability to produce peer-reviewed publications or other professional literature. Where pertinent scientific information implicates multiple scientific disciplines, counties and cities are encouraged to consult a team of qualified scientific experts representing the various disciplines to ensure the identification and inclusion of the best available science.

Mitigation Sequencing

The term "mitigate" means literally "to make less severe or painful; to moderate" (Webster's). For wetlands, habitat, and other critical areas it essentially means *to reduce the total adverse impacts of a project to an acceptable level*. This can be accomplished through a variety of methods. Generally, avoiding the impact altogether is the preferred option. Methods to reduce impacts and mitigate for them should follow a series of steps taken in sequential order.

They are:
(1) **Avoiding** the impact altogether by not taking a certain action or parts of an action (usually by either finding another site or changing the location on the site).
(2) **Minimizing** adverse impacts by limiting magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts.
(3) Rectifying adverse impacts to wetlands, critical aquifer recharge areas, frequently flooded areas, and habitat conservation areas by **repairing, rehabilitating, or restoring** the affected environment to the historical conditions or the conditions existing at the time of the initiation of the project.
(4) **Minimizing** or eliminating the hazard by restoring or stabilizing the hazard area through engineered or other methods.
(5) **Reducing** or eliminating the adverse impacts or hazard over time by preservation and maintenance operations over the life of the action.
(6) **Compensating** for adverse impacts to wetlands, critical aquifer recharge areas, frequently flooded areas, and habitat conservation areas by replacing, enhancing, or providing substitute resources or environments.
(7) **Monitoring** the hazard or other required mitigation and taking remedial action when necessary.

Following this process is referred to as mitigation **sequencing** and mitigation for individual actions may include a combination of the above measures. In most cases, jurisdictions should consider requiring applicants to demonstrate that they have followed this sequence in developing mitigation for their project before permit approval is granted.

Shoreline Master Programs and Critical Areas

Shorelines of the state, as defined by the Shoreline Management Act (SMA), are special aquatic and shoreline areas that require special land use management consideration.[40] As shorelines are subject to changing natural conditions and modifications, these areas should be evaluated to ensure policies and regulations are designed to achieve the goals of the SMA and GMA. Combining shoreline inventory work and assessment with critical areas planning helps to identify key shoreline processes and appropriate land uses.

The SMA is the 14th goal in the GMA. As such, the goals and policies of a Washington State Department of Ecology (Ecology) approved Shoreline Master Program (SMP) are an element of the local government's comprehensive plan and shoreline "use" regulations of the SMP are development regulations.[41]

Ecology is charged with adopting SMP guidelines for development of locally adopted SMPs for regulation of the uses of "shorelines" and "shorelines of statewide significance." The general purpose of the guidelines is to implement the cooperative program of shoreline management between local government and the state. Ecology acts primarily in a supportive and review capacity with an emphasis on providing assistance to local government and ensuring compliance with the policy and provisions of the SMA.[42]

Ecology is expected to adopt the new SMP guidelines by the end of 2003. Proposed WAC 173-26-221(2)(b) offers guiding principles on how local master programs shall address critical areas:

(i) Shoreline master programs shall adhere to the standards established in the following sections, unless it is demonstrated through scientific and technical information as provided in RCW 90.58.100(1) and as described in WAC 173-26-201(2)(a) that an alternative approach provides better resource protection.

(ii) In addressing issues related to critical areas, use scientific and technical information, as described in WAC 173-26-201(2)(a). Local government should be aware of parallel requirements of the Growth Management Act regarding the best available science are provided for in chapter 36.70A RCW. The role of Ecology in reviewing master program provisions for critical areas in shorelines of the state will be based on the Shoreline Management Act and these guidelines.

(iii) In protecting and restoring critical areas within shoreline jurisdiction, integrate the full spectrum of planning and regulatory measures, including the comprehensive plan, interlocal watershed plans, local development regulations, and state, tribal, and federal programs.

(iv) The planning objectives of shoreline management provisions for critical areas shall be the protection of existing ecological functions and ecosystem-wide processes and restoration of degraded ecological functions and ecosystem-wide processes. The regulatory provisions for critical areas shall protect existing ecological functions and ecosystem-wide processes.

(v) Promote human uses and values that are compatible with the other objectives of this section, such as public access and aesthetic values, provided they do not significantly adversely impact ecological functions.

(vi) Implement, where applicable and consistent with the objectives of the SMA, the minimum guidelines in WAC 365-190-080 and ensure that the protection afforded to critical areas

[40] See RCW 90.58.
[41] See RCW 36.70A.480.
[42] See RCW 90.58.050.

within shorelines of the state is at least equal to the level of protection provided for non-shoreline critical areas within any one jurisdiction.

In 2003, the Central Puget Sound Growth Management Hearings Board (CPSGMHB) issued a decision in *Everett Shorelines Coalition v. the City of Everett*, CPSGMHB No. 02-3-0009c (January 9, 2003). The petitioners appealed the City of Everett's amended SMP and the Washington State Department of Ecology's (Ecology) approval of the SMP. The decision was the first major review by a growth management hearings board of an SMP under the 1995 amendments that partially integrated the SMA and GMA. The decision is currently on appeal.

The 2003 Legislature responded to the board's decision by adopting ESHB 1933 (Laws of 2003, ch. 321), clarifying the relationship between the SMA and GMA. The Legislature stated:

- Shoreline Hearings Board decisions are to serve as precedent for growth management hearings board decisions reviewing challenges to SMPs;
- The goals and policies of the SMA and GMA continue to be listed without an order of priority;
- Shorelines of statewide significance may include critical areas as defined under the GMA, but shorelines of statewide significance are not critical areas under the GMA simply because they are shorelines of statewide significance;
- SMPs will be reviewed by Ecology for consistency with RCW 90.58.020 and applicable guidelines, and to ensure they provide a level of protection of critical areas at least equal to that provided by the critical areas ordinances adopted under GMA.
- GMHBs may review challenges to SMPs only for compliance with the SMA and the internal consistency provisions of the GMA. This consistency review is the only review of GMA provisions applicable to SMPs. GMA best available science requirements will not apply to SMP updates, rather the use of scientific and technical information in RCW 90.58.100(1) must be demonstrated.

ESHB 1933 does not invalidate existing critical areas ordinances and SMPs. It does not alter the requirement that local government update their critical areas ordinances under the schedule listed in RCW 36.70A.130(4).[43]

More comprehensive guidance on implementation of ESHB 1933 is forthcoming from Ecology and CTED.

SEPA and Critical Areas

Consideration of environmental factors when making informed planning decisions is the foundation of the State Environmental Policy Act (SEPA). Environmental review at the comprehensive planning stage allows the jurisdiction to analyze impacts and determine mitigation system-wide, rather than project-by-project. This allows cumulative impacts to be identified and addressed and provides a more consistent framework for future permit review. Integration of a well-documented SEPA process contributes to general public knowledge, environmental protection, and fiscal efficiency for local government services.[44]

[43] However, SB 6012 (Laws of 2003, Ch. 262) amended the SMA to eventually coordinate the schedule for updating SMPs with the schedule in RCW 36.70A.130 for updating critical areas ordinances.

[44] Refer to the *State Environmental Policy Act Handbook* for additional information, Washington State Department of Ecology Publication #98-114, September 1998.

Benefits to this approach include:

- A more predictable future for the community.
- A better understanding of the capacity of the built and natural environment and the cumulative impacts of planned development community-wide, increasing the potential for protection of environmental values.
- Efficient use of public funds for the provision of public facilities, infrastructure, and services.
- A decrease in the time and cost associated with obtaining permit approval for appropriate projects in suitable locations resulting from early decisions on land use, services, and mitigation strategies.

SEPA documents, developed in conjunction with plan policies, regulations, or incentive programs, and that include a checklist or an EIS, are a good place to list the scientific sources of information that are relied upon in establishing the management standards for critical areas. However, SEPA cannot substitute for critical areas regulations because of the many exemptions in SEPA and the lack of specific standards.

Protecting Critical Areas in Urbanized Areas

One challenging situation in protecting critical areas is in areas that have been built out and offer little or limited ecological function. Streamside vegetated areas may offer limited habitat value or be in need of restoration efforts. Wetlands may be degraded and provide limited functions. Frequently flooded areas may have structures built that are at risk from the next flood. Nonconforming land uses may occur over sensitive aquifer recharge areas. In these situations it will be important to document the existing conditions of the critical areas to understand where opportunities may occur to protect whatever function currently exists. It is especially important to identify, for salmon recovery efforts for example, opportunities to improve fisheries habitat over time. Stormwater management is key to protecting critical areas in urbanizing areas, with special attention to encouraging low impact development techniques in all new development and redevelopment so long as urban densities are still being achieved.

Paul Inghram

Developing a critical area program that can address these issues in a comprehensive way may be the best way to demonstrate "protection" is occurring. Consulting with a scientific expert or a team of experts may be necessary to inventory and assess the local critical areas functions. "Protection" of habitat can also be realized through the adoption of innovative zoning techniques, such as lot consolidation through clustering of buildings and open space corridor designations.[45]

[45] RCW 36.70A.160 requires that fully planning jurisdictions identify open space corridors within and between urban growth areas that will be useful for recreation, wildlife habitat, trails, and connection of critical areas.

For particularly dangerous areas, such as floodways, meander belts, and high frequency flood plains, the county, city, or town could explore a buyout program. Federal funds may be available. Buyout programs protect human life and reduce flood damages over the long-term to avoid repeatedly damaged properties being rebuilt and damaged again. The buyback area can also become a park or greenway and provide increased buffers along rivers, streams, and other waterways even in built up areas. King and Pierce counties are examples of local governments that have successful buyback programs. The Washington State Department of Ecology is the state coordinating agency for the National Flood Insurance Program (NFIP) and can provide information about NFIP programs and funding programs.

Evaluating the functionality of a known critical area is a unique inquiry. For critical areas located in urbanized or urbanizing areas, evaluating the type and function of critical area that exists will offer the jurisdiction the ability to protect whatever critical area function is currently provided and identify opportunities for improving its function over time. Development standards can be designed to accomplish this, once the scientific information is developed and analyzed. The SEPA process should support this effort and identify the principal analytical documents and other materials used in developing the management recommendations and ordinance.[46]

Common sources of "science" that should be relied upon are:

Assessment data: This is data that is developed through inspection and evaluation of site-specific information by a qualified scientific expert. An assessment may or may not involve collection of new data.

Inventory data: This is data that is collected from an entire population or population segment (e.g., individuals in a plant or animal species) or an entire ecosystem or ecosystem segment (e.g., the species in a particular wetland or pond).

Survey data: This is data that is collected from a statistical sample from a population or ecosystem.

Modeling data: This is data that is generated as a mathematical or symbolic simulation or representation of a natural system. Models generally are used to understand and explain occurrences that cannot be directly observed. Modeling methods should be peer reviewed.

Expert opinion: Expert opinion assists the planner with understanding how the scientific information can be translated into management approaches or performance measures that eliminate risk to critical areas functions or values.

Protecting Wetlands in Urban Areas

Wetlands in urban areas may provide different functions than wetlands in rural areas. In particular, wetlands in urban areas may not provide the same type or degree of wildlife habitat, primarily due to isolation from other habitats. However, some urban wetlands may provide critical habitat for one or more species, such as amphibians and birds. Additionally, many urban wetlands provide important water quality or water quantity functions important to aquifer recharge and flood retention.

[46] See *SEPA Handbook*, Washington State Department of Ecology, Publication #98-114, 1998, p. 60.

Protecting wetland functions in urban areas can best be accomplished by taking a comprehensive approach that includes an inventory and assessment of existing wetlands, good surface and stormwater management requirements, and a landscape-based approach to maintaining wildlife habitat. Once wetlands are identified and characterized according to their functions (using either a rating system or function assessment method), decisions can be made about the appropriate levels of protection. In urban areas it is generally more feasible to make detailed decisions about specific wetlands rather than relying on a set of general standards.

Criteria for Assessing Wildlife Potential of an Urban Area

The following questions are designed to help with assessing the potential for wildlife habitat within an urbanized or urbanizing area:

Contextual or External Considerations When Determining Wildlife Habitat Designations:

1. What type of habitat is it? Some habitat types are more critical than others because of limited supply, sensitivity to disturbance, unique wildlife species, or other factors. In general, priority should be given to streams, wetlands, marine shorelines, prairies/meadows, and mature forests.

2. How large is the area? Generally, large patches of a given habitat type are more valuable than small patches. Optimal patch size in Western Washington may be around 75-100 acres. However, the case can be made to protect relatively smaller patches (e.g., 5-20 acres) of diverse vegetation that are more widely distributed across the urban landscape, because these areas help to bring more people in contact with urban wildlife that persist in these smaller patches. Woodlots often serve as "island refuges" for species that would otherwise not be found in a residential neighborhood.

3. Does the area serve as a "corridor" to link otherwise isolated natural areas, parks, preserves, open spaces, or large tracts of land designated for long-term forestry? Corridors are valuable in facilitating movement of animals and in minimizing negative attributes (i.e., reduced numbers and greater vulnerability to local extinction) of island populations. Riparian areas usually provide important movement corridors in urban-rural landscapes.

4. Does the area serve as a "buffer," or is it surrounded by a native vegetation buffer area? Buffers are especially important when human activity may affect the area.

5. What are the surrounding habitat types or land uses? The wildlife in the area may be positively or negatively affected by adjacent habitat or land uses. An area adjacent to an existing park will be more valuable to wildlife than a similar area adjacent to commercial or industrial development.

Internal Considerations When Determining Wildlife Habitat Designations:

1. How structurally diverse (vertically and horizontally) is the habitat? Vertical diversity is derived from the amount and distribution of vegetation and other structural elements in various zones ranging from underground to the tops of the tallest trees. Horizontal diversity is determined by the size and distribution of vegetation patches across the landscape. Greater structural diversity generally increases the area's wildlife diversity. Therefore, a wetland with a patch of trees or open water is generally more valuable than a uniform stand of cattails or spirea. Similarly, a forest with a well-developed understory is generally more valuable

than a dense forest with no understory, and it is generally more valuable than a golf course with widely scattered trees amid acres of lawn. It should be remembered, however, that structural diversity is not static; areas with low structural diversity may become more valuable to fish and wildlife through restoration efforts, particularly in areas that have been degraded by human activities.

2. What are the "edge" conditions? Edges (ecotones) are utilized by relatively greater numbers of species. An area with a mosaic of habitat types that provide an undulating edge is more valuable to wildlife than an area of equal size but with a linear edge.

3. Are snags and/or large trees present? Snags serve a number of important functions for wildlife, especially cavity-nesting birds and mammals. If snags have to be removed for safety reasons, the stump should be left and should be as tall as possible; even decaying stumps only a few feet high can be beneficial to wildlife.

4. Are downed logs present? Logs also serve a number of important functions for some wildlife species, particularly in or near streams and wetlands.

5. Is water present or can it be safely accessed nearby by wildlife? Water is one of the essential components of habitat; wetlands and riparian areas are especially important to wildlife.

6. Do any endangered, threatened, or other priority species (as defined by the Washington Department of Fish and Wildlife) use the area at some time during the year for reproduction? For foraging? For shelter? Areas with priority species are generally more valuable than areas without these species.

Protecting Critical Areas in Natural Resource Lands

The GMA requires designation and protection of critical areas on all lands, including those designated as natural resource lands of long-term commercial significance. At the same time, the GMA has a goal to maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Conservation of productive forest and agricultural lands is encouraged and incompatible uses are discouraged.[47]

All 39 counties are required to classify and designate natural resource lands of long-term commercial significance and to classify, designate, and protect critical areas.[48] Natural resource lands include agricultural, forest, and mineral lands. The 29 counties that are fully planning under the GMA (i.e., adopting comprehensive land use plans and development regulations) are also required to adopt regulations to conserve natural resource lands of long-term commercial significance. The regulations must ensure that the use of lands adjacent to natural resource lands does not interfere with the continued use, in the accustomed manner, and in accordance with best management practices of designated natural resource lands for the production of food, agricultural products, or timber, or for the extraction of minerals.[49]

Whatcom County

Mining and forest practices are regulated through local and state permits that address how natural resources are extracted and the land restored or reclaimed for future uses (i.e., restoration of a mining site or reforestation). Agricultural practices have not typically been regulated through local land use authority. However, there is a need and a requirement to protect critical areas in agricultural lands of long-term commercial significance.

It is significant that RCW 36.70A.060(1), which requires counties and cities planning under the GMA to adopt development regulations to conserve natural resource lands, provides that those regulations "may not prohibit uses legally existing on any parcel prior to their adoption."[50] No similar language is found in RCW 36.70A.060(2), which requires all counties and cities to adopt development regulations to protect critical areas. Accordingly, it appears the GMA allows – but does not mandate – critical areas regulations to require existing uses to be discontinued. But even if there were a provision in the GMA that forbid cities and counties from prohibiting existing uses in critical areas, the GMA would still require counties and cities to reasonably regulate existing activities that damage critical areas.

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[47] See RCW 36.70A.020(8).

[48] See RCW 36.70A.050.

[49] See RCW 36.79A.060.

[50] See *Friends of Skagit County v. Skagit County*, WWGMHB No. 96-2-0025 (Final Decision & Order, Jan. 3, 1997).

The challenge under the GMA is for local governments to go through a deliberative and well-documented process to achieve a balanced program that provides for critical area protection and natural resource long-term production. Local governments need to consider both the sustainability of the natural resource industry and the functions and values of critical areas in determining the most appropriate elements for their critical areas protection program.

Factors to Consider in Developing Critical Areas Protection in Natural Resource Lands

Agricultural Lands and the Economy in Washington

Agriculture is one of the central elements of economic development for rural counties and in the rural areas of more urban counties. Agriculture, from primary production to supporting industries, is by far the single largest source of jobs and economic activity in rural areas statewide and will remain so for the foreseeable future.[51] In addition to primary production, supporting industries include food processing, transportation facilities, farm implements, fertilizers, and irrigation systems.

In recognition of the importance of the agricultural and other natural resource industries, the GMA requires counties to designate and conserve agricultural lands of long-term commercial significance. A number of counties have designated both agricultural lands of long-term commercial significance and rural agricultural lands. Both are important to the economy. Even if agricultural land does not meet the criteria for long-term commercial, smaller farms can be an important source of income for rural residents.

Washington state hosts a tremendous diversity of crops and types of food production. Each type of crop or food product is unique in its land and built infrastructure requirements. Beneficial to a discussion of critical areas protection is an examination of the types of production and needs of the agricultural industry in any one county.

The state is also extremely diverse in climate and ecosystems. This creates a substantial challenge for developing farm practices that help conserve the industry and protect critical areas. Types and condition of critical areas, local species, and habitats that exist throughout agricultural lands should be examined and evaluated for critical area conservation opportunities. Communities will need to consider the unique landscape characteristics of the area, whether it is shrub steppe, Columbia River floodplain, tidal estuary, or lowland Western Washington prairies.

Land Use Impacts to the Farm Economy

Despite agriculture's economic significance to the state's economy, there are many land use trends affecting the farming industry's future. The trend toward sprawling residential development in rural areas has resulted in the loss of prime agricultural lands.[52] To decrease pressure on farmers to convert to other uses, innovative techniques that are encouraged and recommended by the GMA to conserve these lands include agricultural zoning that limits the density of development and restricts non-farm uses and cluster zoning with open space

[51] This statement refers to rural areas on a statewide level. However, it may not be true for rural areas in every county. CTED notes that this statement may not apply to some counties that have very few or no designated agricultural lands of long-term commercial significance.

[52] Between 1982 and 1996, Washington lost some 59,747 acres in farmland (Washington Agricultural Statistics 1995-1996 *Annual Statistical Report*, Table 1, Land in Farms).

designation. Other economic tools used to conserve farmland include the purchase or transfer of development rights. Critical areas protection should be consistent with and complement conservation techniques adopted by a county or city.

Impacts to Fisheries and Aquaculture in Washington State

Washington is the largest producer of processed seafood and the second largest exporter of seafood in the United States. Aquaculture produced $30.5 million in 2001.[53] In 2001, $1 billion was spent on recreational fishing.[54] The economic benefits of the commercial fishery were estimated to be $289.2 million.[55] These numbers are greatly reduced from previous years due to the listing of seven salmon and steelhead stocks under the federal Endangered Species Act (ESA) in 1999.

Impacts to fisheries have been identified as the result of harvest, hydropower dams that block fish passage to and from spawning grounds, competition from hatchery fish, and habitat degradation from land use practices including point and non-point pollution. Of these four types of impacts, local jurisdictions have the most authority through their police power to protect shellfish and fish habitat from land use impacts.

A positive contribution of the GMA is that productive shellfish beds and aquaculture lands in marine areas can be designated as resource lands. This action can help sustain both the natural resource economy and the important nearshore critical areas for fish and wildlife habitat conservation.

Suggested Approaches for Providing Critical Areas Protection and Keeping Natural Resource Lands Viable

Building the Legal Record

Counties (and in some instances, cities) may face significant challenges in their efforts to protect critical areas on natural resource lands. For example, there will be instances where local governments must reconcile the need to protect critical areas with the need to conserve farmland and enhance the agricultural industry. Consequently, it will be important for local governments to build a record that documents the inclusion of the best available science in critical areas protection, as well as consideration of the economic impacts to local natural resource industries. The record should include local information about critical areas generated through inventory, survey, and assessment data. Once this level of information is known, management approaches necessary for protecting critical areas functions can be developed that look at local circumstances and opportunities.

In developing a critical areas protection program, the record should include relevant sources of the best available science.[56] Any nonscientific information – including legal, social, cultural, economic, and political information – used as a basis for critical areas policies and regulations

[53] The Washington Department of Fish and Wildlife annually calculates the value of aquaculture production. Aquaculture total excludes trout, which was separately calculated at $8 million in 2001.

[54] See 2001 U.S. Fish and Wildlife Service survey.

[55] The figure is based on a 1998 Pacific Fishery Management Council estimate of the economic benefit of the commercial fishery, calculated as 2.1 times the ex-vessel value of the catch.

[56] Science that is not specific to agricultural lands can be useful in developing critical areas protection programs for agricultural lands.

that depart from the best available science should also be identified. A county or city departing from science-based recommendations should:

- Identify the information in the record that supports its decision to depart from science-based recommendations.
- Explain its rationale for departing from science-based recommendations.
- Identify potential risks to the functions and values of the critical area or areas at issue and any additional measures chosen to limit such risks.

SEPA review often provides an opportunity to establish and publish the record of this assessment.[57]

Any consideration of the economic impacts of a critical areas protection program to the sustainability of a natural resource industry should be well documented in the record for developing the program. A methodology for economic modeling is beyond the scope of this guidebook, but should include both the costs and benefits of critical areas protection. In the context of agricultural land, a list of factors for analysis might include:

- Agricultural production – A methodology that looks at the cost of removing land from farm production would also need to look at offsetting factors, such as the amount of land that is not physically suitable for production (e.g., steep slope), as well as any land for which the farmer is receiving a subsidy or compensation (e.g., Conservation Reserve Enhancement Program payments at 200 percent rental rate that may offset costs or result in a net benefit).
- Recreational wildlife activities – fishing, hunting, wildlife watching, etc.
- Commercial fishing.
- Tribal fishing.
- Agri-tourism such as county fairs, local farmers markets, wine tasting venues, fruit and vegetable stands, farm tours, festivals, etc.
- Secondary impacts on the local economy – impacts to agricultural infrastructure, as well as benefits to the local economy. For example, a farmer enrolled in a federal restoration program may also be contributing to the local economy by buying trees and shrubs from nurseries, employing workers to plant vegetation and build instream structures, etc.

Based on the considerations discussed above, local governments should develop a "ledger" of all of the critical areas, economic, and other values that they are considering and a thoughtful way to work through them in developing critical area protection programs. Objectives or goals should be developed to describe what they want to accomplish in meeting the requirements of the GMA. These considerations will then guide the strategy they choose to achieve those objectives or goals.

Agricultural Lands

The Impacts of Farm Practices on Critical Areas

Beyond the loss of riparian habitat as a result of direct conversion to agricultural land, agricultural operations can result in sources of non-point source pollution. Established farm buildings with large roof areas can create run-off of precipitation that can affect surface waters. Spills of fuel or fertilizer from on-farm storage structures can pollute ground and surface waters. Streams in agricultural areas may be susceptible to elevated temperatures given that most agricultural areas are in the lowlands and many streams do not have extensive vegetated buffers.

Improper farm practices as well as existing non-conforming farm operations can result in:

[57] See WAC 365-195-915.

- Soil erosion and sedimentation that affect habitat and water quality.
- Pesticide and fertilizer pollution that impact fish and wildlife survival, kill nontarget insect species, and impact aquatic plants.
- Animal wastes that degrade water quality, reduce fish production, introduce diseases to water that are harmful to people, and cause excessive aquatic plant and algael growth.[58]

Overgrazing is one of the most destructive forces in riparian ecosystems and is usually the result of inappropriate livestock management. Grazing can affect all characteristics of riparian and associated aquatic systems, including vegetative cover, soil stability, bank and channel structure, instream structure, and water quantity and quality.[59]

In developing a critical areas protection program, counties and cities need to recognize that different types of agriculture have different types of impacts. For example, drainage agriculture raises very different issues than from livestock or dairy, irrigated agriculture is different than dry land, and cover crops are different than tree fruit. Local government needs to understand the types of impacts generated by each type of operation to determine what rules or best management practices will apply to protect the types of critical areas identified in that jurisdiction.

Strategies for Protection of Critical Areas in Agricultural Lands

Since local governments do not typically require a permit to farm, there is usually no specific activity that triggers local review to determine whether an agricultural practice is having an impact on a critical area. However, agricultural activities are somewhat unique in that there are a variety of federal programs that compensate landowners for voluntarily protecting and enhancing certain critical areas functions. The development of both regulatory and nonregulatory programs should be considered in the context of the need to conserve agricultural land and preserve important ecological processes.

Regulatory Programs

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.

Regulatory programs provide certainty when there is a specific action that requires a permit. However, in the context of agricultural practices, regulations can be difficult and costly to implement without the understanding and cooperation of the landowners.

Some options for protection of aquaculture or shellfish lands may include both site specific water quality protection measures such as buffers and biofiltration swales and development

[58] See Washington Department of Fish and Wildlife, *Priority Habitat and Species, Management Recommendations for Washington's Priority Habitats: Riparian* (1997), pp. 56-58.

[59] See Washington Department of Fish and Wildlife, *Priority Habitat and Species, Management Recommendations for Washington's Priority Habitats: Riparian* (1997), pp. 60-61.

regulations that limit or prohibit adjacent incompatible uses, reduce densities in vulnerable upland areas, limit impervious surface areas, require retention of land cover, or more restrictive design and maintenance standards for on-site sewage disposal systems.

Nonregulatory and Incentive Programs

Programs that provide incentives for implementing best management practices in agricultural lands provide a good approach to protecting critical areas given the challenges of regulating farm practices and the need to maintain and enhance the agricultural industry. For many jurisdictions that are seeking to balance the economic needs of the agricultural industry with the requirement to protect critical areas, nonregulatory, incentive-based approaches that can be easily monitored by the local government may appear to be the most promising means of achieving critical areas protection.

Cooperative and nonregulatory, incentive-based programs that promote best management practices can be used to provide some or all of the protection needed to protect the functions and values of critical areas in agricultural lands. This is premised on the assurance that they are comprehensive, achieve the outcomes for protecting critical areas over time, and are implemented with a high degree of certainty. To ensure certainty, implementation of voluntary programs should be monitored for effectiveness, tracked with an adequately funded adaptive management program, and backed by development regulations that adequately protect critical areas if protection is not being achieved after a reasonable period of time.

Best management practices have been developed to control water and soil erosion both on the farm and off. Leaving vegetation along streams, contour plowing (plowing across the slope), and terracing decrease the speed of runoff and allow for more water to soak into the soil. More recently, many farmers have adopted "conservation tillage" and "no till" farming methods.

Best management practices can be encouraged and landowners compensated for their implementation through a variety of federal programs. Working with the local conservation district, Washington State University Extension Service, or the Natural Resource Conservation Service (NRCS) on identifying the best management practices for the site through a federal program is encouraged. Some examples of federal programs that are available include:

- *Conservation Reserve Enhancement Program (CREP)* – CREP is a joint partnership between the state of Washington and U.S. Department of Agriculture that is administered by the Washington State Conservation Commission and the Farm Services Agency (FSA) to restore riparian habitat. Under the voluntary program, land enrolled in CREP is removed from production and grazing under ten- or 15-year contracts. In return for planting trees and shrubs to stabilize the stream bank and to provide a number of additional ecological functions, landowners receive payments to cover annual rent, incentive and maintenance payments, and cost share for practice installations. Payments can result in no cost to the landowner for participation.

- *Conservation Reserve Program (CRP)* – CRP provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. Funding from the Commodity Credit Corporation (CCC) provides assistance to farmers and ranchers in complying with federal, state, and tribal environmental laws, and encourages environmental enhancement.

- *Environmental Quality Incentives Program (EQIP)* – EQIP provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial manner. Contracts of up to ten years are made with eligible producers to implement one or more eligible conservation practices, such as animal waste management facilities, terraces, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices.

Local governments that include federal programs in their critical areas protection programs need to understand how federal programs fit with local protection goals and requirements, as farmers are very familiar with them. Local governments should work closely with federal agencies and local conservation districts to understand these programs. For example, NRCS can explain how the field office technical guides are used as a basis for best management practices.

Local governments also need to be aware of issues that can come up if they choose to rely on federal programs for critical areas protection. For example, a farmer's eligibility for a federal program may be affected by local regulatory requirements because the federal programs are intentionally voluntary. If riparian buffers are mandated by local regulations, a farmer may not be eligible for CREP. A related issue is that farm plans are not subject to public disclosure requirements under federal law. The federal and state agencies, as well as local conservation districts, understand the nuances of these programs and can help a county or city work through these issues. For example, a local conservation district may be able to work with the property owner to exclude proprietary information from a farm plan.

There are a variety of state programs that farmers and local governments can access also. They include the Salmon Recovery Fund, the Interagency Committee on Outdoor Recreation's Washington Wildlife and Recreation Program, and the Washington State Department of Natural Resources' Aquatic Land Enhancement Grants.

Finally, counties and cities have a variety of local nonregulatory tools that can be used to develop a critical areas program for agricultural lands. They include:

- *Comprehensive land use plan policies* – policies in the plan requiring use of incentive programs to encourage water quality and habitat protection.
- *Land acquisition or purchase of conservation easements* – county and city programs for acquisition funded by conservation futures or other local funding sources and federal and state funding noted above.
- *Long-term lease* – land trust/governmental agency leases property from the landowner, thereby preventing other uses of the property during the lease term.
- *Restoration of habitat projects* – projects to create fish passage at culverts, restore estuaries, etc. with conservation futures or other local funding sources and federal and state funding noted above.
- *Purchase of development rights* – the local government purchases rights to develop allowed under current zoning from the landowner with conservation futures or other local, state, or federal funding sources.
- *Transfer of development rights* – the local government sets up a program whereby development rights may be transferred from agricultural land to an area where higher densities are encouraged.
- *Open space taxation* – The Open Space Taxation Act, enacted in 1970, allows property owners to have their open space, farm and agricultural, and timber lands valued at their current use rather than their highest and best use. The act allows for property tax abatement for land designated as open space land in local comprehensive and zoned accordingly or

otherwise meeting certain criteria. To receive property tax relief, a landowner must apply for and receive the open space classification and abide by the restrictions placed upon the land in the open space classification. The owner is obliged to leave property in the program for ten years, or face penalties upon withdrawal. Some counties have made it easier for property owners to enter the system by adopting a public benefit rating system. If the county legislative authority has established a public benefit rating system for the open space classification, the criteria contained within the rating system govern both the eligibility of the lands described in each application filed for that classification and the current use valuation of that land.

- *Habitat conservation plans* under the federal Endangered Species Act.
- *Comprehensive irrigation district plans.*

While incentive-based programs can help address the need to keep agriculture viable, it should be recognized that they are expensive. The costs may include compensation to landowners, restoration projects, more intensive management by the county or city, monitoring, and an adaptive management program. Use of federal and state programs, as well as local land trusts, should be considered to leverage local resources.

A list of federal, state, and local nonregulatory programs is attached in Appendix G.

A Comprehensive Critical Areas Protection Program for Agricultural Lands

Most critical areas protection programs will probably include a blend of regulatory and nonregulatory approaches and tools. Given the diversity of habitats and ecosystems and the diversity of the agricultural industry around the state, each county must develop an approach that works locally. Regulatory and nonregulatory programs should be flexible based on type of crop/farming activities and ecosystem type – the goal is to achieve good management practices that keep farms in production and protect critical areas.

Forestry

Forest Practices Impacts on Critical Areas[60]

Forest practices, including timber harvest and its associated activities (e.g., road building, pre-commercial thinning, controlled burning, herbicide and insecticide spraying), temporarily or permanently alter the character of forested landscapes, including critical areas. For example, vegetation removal, road construction, and soil disturbance are the chief mechanisms by which forest practices influence riparian areas. These disturbances result in:

- Hydrologic (relating to water flow) effects.
- Soil destabilization, erosion, and sedimentation.
- Stream temperature increases and a more severe microclimate.
- Loss of large woody debris.
- Fish and wildlife effects.
- Cumulative effects.

[60] See Washington Department of Fish and Wildlife, *Priority Habitat and Species, Management Recommendations for Washington's Priority Habitats: Riparian* (1997), p. 39.

Protecting Critical Areas in Forest Lands

Operations on forest lands are governed by the Forest Practices Act, which is administered by the Washington State Department of Natural Resources (DNR). Forest practices include practices related to growing, harvesting, or processing timber, including, but not limited to, road construction and maintenance, thinning, salvage, harvesting, reforestation, brush control, and using fertilizers or pesticides.

All forest practices activities are administered by DNR. When a proposed forest activity has been classified as a Class IV forest practice for a conversion of forestland to another use, or when a forest activity requiring a forest practices application is located within an urban growth area as required by RCW 36.70A.110, the local governments' critical areas ordinances will apply.

DNR will continue to administer the forest practices rules within urban growth areas until the county or city's ordinances meet the requirements of RCW 76.09.240 for the transfer of jurisdiction to the local government. DNR, in consultation with Washington State Department of Ecology, will determine if the county or city's regulations meet the conditions of RCW 76.09.240, including a review of the ordinances to ensure that they meet or exceed the Forest Practices Rules in place at the time of transfer. Each local government's critical areas ordinance must ensure that all land disturbance activities, such as brush removal or clearing and grading, are governed by the ordinance.

The Shoreline Management Act (SMA) applies to forest practices. Forest practices that constitute a substantial development within the "shoreline" as defined by the SMA require a substantial development permit. Other forest practices also need to comply with the requirements of the shoreline master program.

Mineral Resource Lands

Impacts of Mining on Critical Areas

Aggregate and hard rock mining can impact critical areas through ground water harvest and pollution, surface water pollution, slope stability, ground surface subsidence, and noise, light, and vibration impacts to people and sensitive wildlife species. The processing of minerals into asphalt or other aggregate products may also have an effect on air quality, noise, light, and surface water pollution. Local governments should regulate the time of mining operation and condition permits to ensure that habitat and water quantity and quality issues are addressed and avoided. The issuance of a water rights permit may be required if it is determined that aquifers will be impacted by mining activity.

Protecting Critical Areas in Mineral Resource Lands

As with other natural resource lands, local governments are required to designate mineral lands of long-term commercial significance. They are responsible for approval of mine siting and operations. DNR regulates certain aspects of the mineral industry, including surface mine and metal mine reclamation. Critical areas that may overlay designated mineral resource lands include critical aquifer recharge areas, frequently flooded areas, geologically unstable areas, and fish and wildlife habitat conservation areas. Local designation of both resource lands and critical areas should consider ranking designated mineral resource lands on the basis of several factors to

assign priority levels to these designated lands. Criteria to consider in assigning priorities could include their ease of access for transportation, surrounding land uses and the compatibility of mining with those uses, the quantity and quality of the resource, demand for the resource, and environmental impacts of mining based on local circumstances including the presence of critical areas.

Technical Assistance Available From State and Federal Agencies

Washington Department of Fish and Wildlife work with conservation districts – http://www.wa.gov/wdfw/
Washington State Department of Agriculture – http://agr.wa.gov/
Washington Conservation Commission – http://www.scc.wa.gov/
Washington State Department of Natural Resources – http://www.dnr.wa.gov/
U.S. Department of Agriculture – Natural Resource Conservation Service – http://www.nrcs.usda.gov/

Protecting Wetlands

The Washington State Department of Ecology (Ecology) produced new wetland guidance documents in 2005. The two volume guidance includes: *Wetlands in Washington, Volume 1: A Synthesis of the Science* (Publication #05-06-006) and *Wetlands in Washington, Volume 2: Guidance for Protecting and Managing Wetlands* (Publication #05-06-008.) A CD or printed copy of these documents can be obtained by contacting Ecology at (360) 407-7472 or jewis461@ecy.wa.gov. Volume I is a synthesis of current wetland science on wetlands functions, how human activities affect wetlands, and the effectiveness of different management tools. Volume II includes management options and recommendations based on the information in Volume I. Both documents were developed with significant input from local governments and were peer reviewed. Volume II contains several appendices with additional information specific to critical areas ordinances. Appendix 8 includes eight sections with pertinent wetlands information useful in crafting local regulations. Of special interest for some local governments, Appendix 8C offers an alternative approach to setting buffers for specific wetlands, based upon their type and setting. For more information on these documents, visit Ecology's Web site at http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html or contact Teri Granger at (360) 407-6857.

Guidance

The functions that wetlands perform occur at different geographic scales. In addition, impacts to wetlands can result from human activities and land uses that are both adjacent to, or upgradient from, wetlands. Thus, the management and protection of wetlands requires addressing both landscape- and site-scales.

Landscape Scale

Wetland functions can be adversely affected by activities that occur far from the wetland. Maintaining a wetland's hydro-period (water level, water depths, the duration of flooding, and fluctuations in water levels) can only be accomplished by managing surface water throughout the wetland's contributing basin. Protecting the wildlife habitat functions of a wetland requires maintaining habitat connections with other wetlands and other habitat areas. While a significant degree of protection can be ensured by protecting a wetland from direct disturbances and maintaining an adequate buffer, the best available science makes clear that landscape scale management is necessary to ensure protection of all functions.

To protect the water regime in a watershed, it is important to limit impervious surfaces and retain as much forest cover as possible in a drainage basin. Much of this can be accomplished by having an effective stormwater management program. Likewise, it is important to maintain connectivity between wetlands, riparian areas, and significant habitat areas. Watershed or basin planning, wetland and wildlife habitat inventories, low impact development standards, and conservation incentives are all important tools that can help address landscape level protection at a landscape scale.

Site Scale

The regulation of land use activities in and around wetlands is the most common method of protecting wetland functions. Local governments that rely upon regulation/permitting of new development as the sole means of protecting wetlands should adopt very high protection standards to ensure minimal loss of wetland functions.

The first step in this process is to minimize conflicts created by unreasonable expectations regarding the potential use of property. This requires appropriate land use zoning based on good wetland inventory and assessment information. Some of the current contentiousness surrounding wetlands can be reduced by ensuring that wetlands are clearly identified before property is zoned for a type of land use that is incompatible with wetland protection. However, much land is already zoned and many wetlands are not clearly identified in existing inventories.

Whether or not properties with wetlands are clearly identified and appropriately zoned, some type of permit regulations are necessary to ensure protection of wetlands. The primary components of effective wetland regulations are identified below.

Wetland Designation and Delineation

The definition of wetlands is established in statute [RCW 36.70A.030(22)] and the required method for delineating wetland boundaries (RCW 36.70A.175). In the early 1990s, Ecology suggested that smaller wetlands could be exempted from regulation for administrative reasons without a significant loss of wetland function. However, more recent scientific information makes clear that small wetlands provide important functions that larger wetlands do not provide and that the cumulative effect of eliminating many small wetlands is substantial. As a result, exempting any wetlands based on size is inappropriate; there simply is no scientific justification for doing so.

Wetland Rating (or Categorization)

The foundation of most wetland regulatory programs is a wetland rating system. Since wetlands are highly variable and can provide very different functions, it is necessary to divide them into different groupings. This allows for the opportunity to provide the appropriate level of protection. Any wetland rating system should be based on good scientific information regarding how a wetland functions, how sensitive a wetland is to human disturbances, how rare a wetland type is, and how easily a wetland can be replicated. Ecology developed wetland rating systems for Eastern and Western Washington in the early 1990s that were based on the agency's understanding of wetland science at the time. These rating systems are being revised to incorporate more recent scientific information. Local governments are encouraged to use the appropriate state rating system because they have been developed by a team of wetland specialists and local planning staff to ensure both scientific validity and administrative feasibility. If a city or county decides to develop their own rating system they should ensure that it is based on sound scientific information. When a local rating system is used, be aware that if a state or federal

permit or approval is needed, the wetland may also need to be rated under the state system. This duplication of effort could increase costs for applicants with no scientific benefit.

Activities Regulated/Exempted

There are many types of activities that can adversely impact wetlands. At a minimum, it is important to regulate all activities that directly impact wetland water, soils, and vegetation such as filling, draining, excavation, clearing, flooding, etc. Any exempted activities should be limited to those that will not have a significant impact on wetland water, soils, or vegetation and which are expected to be very short-term such as site investigative work, maintenance of existing ditches or structures, etc.

Standards for Allowing Alterations

Since scientific studies continue to demonstrate that creating or restoring wetlands is very difficult to accomplish, it is important to avoid all unnecessary impacts to wetlands. Thus, wetland regulations should include language that emphasizes the avoidance of wetland impacts whenever possible. The burden of proof should be on the landowner to demonstrate alterations to wetlands are unavoidable. High-quality wetlands should only be impacted in very limited situations. For example, bogs and other very high-quality wetlands should only be impacted if needed to provide for a reasonable use of the property or for a transportation or utility corridor that cannot be relocated.

Mitigation

Wetland mitigation is defined in terms of a series of steps that should be taken in sequential order [see discussion about mitigation sequencing in Section X.20.050(A) of Appendix A]. When adverse wetland impacts are truly "unavoidable," compensatory mitigation that replaces or provides substitute resources or environments should be provided. This can include creation of a new wetland, restoration of a former wetland, enhancement of a degraded wetland, or some combination of the three. In some instances, preservation of high-quality wetlands and/or adjacent high-quality uplands may be acceptable as part of an overall mitigation "package." Historically, creation of new wetlands in upland sites has been difficult, primarily due to problems with establishing an adequate water regime to sustain wetland conditions. Recent studies have shown that enhancement of existing wetlands has also frequently failed to adequately compensate for the loss of wetlands. Thus, regulations should emphasize restoration of former wetlands as the preferred method of compensation.

Mitigation regulations should also include language that directs applicants where to conduct compensatory mitigation activities and should state a preference for locations near the impact to ensure that the lost functions will be replaced. However, the preference for mitigation to be conducted "on-site" is no longer considered to be critical because it frequently results in inappropriate mitigation design in order to "fit" the mitigation on the property where the development is occurring.

Another important aspect of mitigation is the use of **replacement ratios**. A replacement ratio is the amount of wetland area created, restored, or enhanced in relation to the amount of wetland area impacted. For example, historically a replacement ratio of 1:1 was common. This means for every acre of wetland impacted an acre of wetland would be created. However, the considerable research into mitigation effectiveness has shown that mitigation projects frequently fail and, when successful, they take more than ten years to be fully functioning.

Generally, replacement ratios should be based on the rating of the wetland and the type of mitigation. Recommended ratios for creation and restoration are:

Category I	6:1
Category II	3:1
Category III	2:1
Category IV	1.5:1

Ratios for wetland enhancement should be doubled. Enhancement as compensation for wetland losses results in a net loss of wetland area and the net gain in wetland function from enhancement is almost always less than from creation or restoration. Provisions for adjusting ratios up or down based on specific criteria should be included. Examples are provided in the Example Code Provisions.

Monitoring Plans

Given the poor track record of compensatory mitigation, it is critical to require an adequate monitoring plan for a mitigation site. The standard length of time for monitoring a mitigation site has increased over the years as projects have demonstrated how slowly wetlands mitigation sites evolve. At present, five years is the minimum standard and, in many cases, especially where forested wetlands are being created or restored, a period of ten years or longer is standard. Increasingly, invasion of a created or restored wetland by aggressive, non-native plant species is a major concern. It is essential that the mitigation plan takes into account the potential for invasion and includes monitoring and maintenance provisions to ensure success.

Mitigation Banking

Mitigation banking is a concept that is receiving increasing attention and support. The general idea is to create or restore a large wetland area and use the "credit" to compensate for wetland impacts that occur elsewhere. If conducted appropriately, this approach can be beneficial to applicants and the environment. Project proponents benefit by not having to take on a risky, open-ended mitigation project and the environment benefits by having a functioning replacement wetland in place before the impact occurs. Local regulations should include language to allow mitigation banking.

Buffers

Wetland buffers have been a subject of considerable debate and discussion in recent years. While some people still challenge the need for any buffers, most of the debate centers on "how much is enough?"

Wetland buffers are important to protect the functions provided by wetlands. They do this in two basic ways:

(1) Buffers reduce the adverse impacts of adjacent land uses by:

- Stabilizing soil and preventing erosion.
- Filtering suspended solids, nutrients, and toxic substances.
- Moderating impacts of stormwater runoff.
- Reducing noise, light, intrusion, and other disturbances.

(2) Buffers provide important habitat for wildlife which use the wetland and the buffer area for essential feeding, nesting, breeding, rearing, and resting. For example, some waterfowl feed in the wetlands and nest in adjacent uplands while many amphibians spend the majority of

their lives in forested areas adjacent to a wetland and breed in wetlands. Without protecting adjacent upland areas, wetlands would not be able to support these wildlife species.

How Much Is Enough?

This is the question most often asked and debated about buffers. Unfortunately, there is no single definitive answer for all wetlands. Appropriate buffer widths should be determined based on the four major variables described below: (1) wetland function and sensitivity to disturbance; (2) buffer characteristics of the existing or proposed buffer; (3) land use impacts of land uses adjacent to the buffer; and (4) desired buffer functions of the buffer itself.

Wetland function and sensitivity to disturbance are attributes that will influence the necessary level of protection needed for a wetland. Wetlands systems that are extremely sensitive or have important functions will require larger buffers to protect them from disturbances (e.g., high-quality estuarine wetlands and bogs need larger buffer widths to ensure a lower risk of disturbance.)

Characteristics of the existing or proposed buffer such as vegetative composition, plant density, soils, and slope are all important factors in determining effective buffer widths.

Impacts of adjacent land use impacts play a significant role in determining buffer widths. Construction impacts include erosion and sedimentation, debris disposal, vegetation removal, and noise. Post-construction impacts are variable depending on the land use, but residential land use, in particular, can have significant impacts.

Desired functions of the buffer are pertinent in determining appropriate buffer widths. Removal of coarse sediments in runoff moderation, for example, will require smaller buffer widths than some wildlife habitat or other water quality functions.

Buffer widths for wildlife may be generalized, but specific habitat needs of wildlife species depends on individual habitat requirements. Despite the benefits of site-specific analysis to determine appropriate buffer widths it is appropriate to rely upon standard widths or ranges as a starting point to provide some consistency and predictability. This approach can include provisions for adjusting buffer widths up or down based on site-specific factors.

Ecology recommends the following buffer widths to be used in conjunction with the state's original four-tiered rating system published in 1991. The definitions of high-, moderate-, and low-intensity land uses are found in the example code language in the Example Code Provisions. (These are found on the following pages of Appendix A: high, page A-121; moderate, page A-124; and low, page A-123.)

a. Category I

High intensity	300 feet
Moderate intensity	250 feet
Low intensity	200 feet

b. Category II

High intensity	200 feet
Moderate intensity	150 feet
Low intensity	100 feet

c. Category III

High intensity	100 feet
Moderate intensity	75 feet
Low intensity	50 feet

d. Category IV

High intensity	50 feet
Moderate intensity	35 feet
Low intensity	25 feet

Nonregulatory Approaches to Protecting Wetlands

While a regulatory, permit-based approach to protecting wetlands is a critical element in a local wetland protection program, nonregulatory elements provide an effective complement to a regulatory approach. Providing incentives to landowners in the form of property tax reductions encourages the voluntary protection of wetlands. Developing a nonregulatory restoration program helps offset the cumulative impacts that inevitably result from exemptions and exceptions in the regulations. Ecology will be developing specific guidance on the full range of nonregulatory approaches as part of its document on wetland protection options and recommendations.

VIII. Getting Help

Designating and protecting critical areas can be an arduous task. Simply understanding which lands are critical areas and which are not may require precise technical expertise. Additional scientific understanding may be needed to review and document the best available science and include it in the policies and regulations that are drafted to protect local critical areas. With limited resources, it is often difficult for cities and counties to obtain the necessary technical expertise. This section provides information about obtaining assistance from:

- State agencies.
- Regional collaboration.
- Private consulting firms.

Assistance from the State

State agencies are available to provide local communities with help identifying critical areas, drafting regulations, developing nonregulatory programs, and reviewing projects that may impact critical areas. This section provides information about obtaining technical and program assistance from state agencies for each type of critical area.

The state departments of Ecology, Fish and Wildlife, and Natural Resources have staff available to provide technical assistance identifying and protecting critical areas. Additionally, staff at the Department of Community, Trade and Economic Development (CTED) is available to provide assistance with development regulations and issues related to meeting the requirements of the GMA. CTED is also able to help in identifying key state agency staff and to coordinate assistance from other state agencies.

Local jurisdictions are encouraged to contact CTED and other agencies early in the development phase of updates to their comprehensive plans and development regulations. Agency staff with expertise can provide advice and the most up-to-date information early in the process while the critical areas protection program is being developed. Staff can assist in the identification of critical areas and the most recent best available science.

For assistance in locating state agency resources,
contact Growth Management Services of CTED at (360) 725-3000.

Regional Collaboration

Considering that neighboring jurisdictions may be faced with similar circumstances, it may be beneficial for communities to work together to address critical areas protection. Ecosystems do not stop at city and county borders. Most critical areas are part of larger geographical networks, such as rivers, shorelines, and fault lines, that extend through multiple jurisdictions.

Cities should plan to coordinate with each other and with their county to share costs and resources to identify and map critical areas, to review the best science that is available and locally applicable, and to draft regulations. Regional councils of government may help coordinate development of critical area regulations. Multiple jurisdictions may also pool resources in nonregulatory programs. For example, purchasing or management of critical areas easements may be infeasible for an individual jurisdiction, but could be accomplished through a consortium

of agencies and non-governmental organizations (such as land trusts) combining resources. Partnering with local land trust organizations has proven helpful in overseeing the successful implementation of landowner conservation easement agreements and other land conservation strategies.

Another opportunity for regional collaboration and improved efficiency is linking efforts at updating shoreline master programs with work on critical areas ordinances. Similar efforts that examine local shoreline conditions such as geology, hydrology, and current and potential land use impacts can be used to benefit both critical areas protection and shoreline designations and use regulations.

Hiring Outside Help

It is rare for local government staff to have expertise in biological or geological functions of critical areas. Even if local staff has the technical expertise, rarely do they have an opportunity to dedicate sufficient time to inventorying critical areas and drafting regulations. To conduct a thorough review of local conditions or to focus on a specific project, jurisdictions may want to consider utilizing professional assistance. Consultants can provide a variety of assistance, including technical assistance with specific critical areas, identifying habitat areas, developing comprehensive protection programs, and updating regulations.

Consultants may be hired by local municipalities or by landowners who want to undertake a project on their property that may affect a critical area. Some consultants are self-employed, while others work for larger environmental and planning consulting firms.

How to Find a Consultant

There are a number of ways to find the names of critical areas consultants. One approach is to look in the Yellow Pages of your phone directory (or the directories of the closest cities) under "Environmental and Ecological Services" or "Planners." Some resource or membership organizations may provide lists of consultants, such as the Municipal Research and Services Center of Washington (MRSC) (http://www.mrsc.org/lgsd/industrylist.aspx) and Washington Chapter of the American Planning Association (http://www.washington-apa.org/). You may also contact other local government planning offices and ask if they know of any local critical areas consultants.

Selecting a Critical Areas Consultant

There are a number of factors you should consider before hiring a critical areas consultant or consultants. The Best Available Science Rule (WAC 365-195-915) recommends that a "qualified scientific expert" be consulted to provide the guidance necessary to determine what information is truly the "best available science," and to assess its applicability to the relevant critical areas. These qualifications require the consultant to have expertise appropriate to the relevant critical areas, as evidenced by possession of professional credentials or certification, a relevant advanced degree earned from a recognized university, a sufficient number of years of experience in the applicable scientific discipline, and so forth. As you select a consultant or consultants, be sure to ask the following questions:

Training – Does the consultant have training or experience in the use of recognized methods of critical areas identification? For example, a wetlands consultant should be experienced using the 1987 federal or 1997 state wetlands delineation manuals. A critical areas report for a geologically

hazardous area should be prepared by a licensed geotechnical engineer or geologist, or by a geologist or soil scientist who earns his or her livelihood from the field of geology. Has the consultant had additional training or expertise in related fields such as zoning, planning, biology, botany, soils, hydrology, hydrogeology, geology, wildlife, or engineering, as may be appropriate?

Experience – How much experience does the consultant have identifying and delineating critical areas in the field, assessing functions and values, or working with critical areas regulations? Where in the state does the consultant have experience working? Is the consultant experienced in writing regulations and ensuring their consistency with the GMA, local plans, and other regulations?

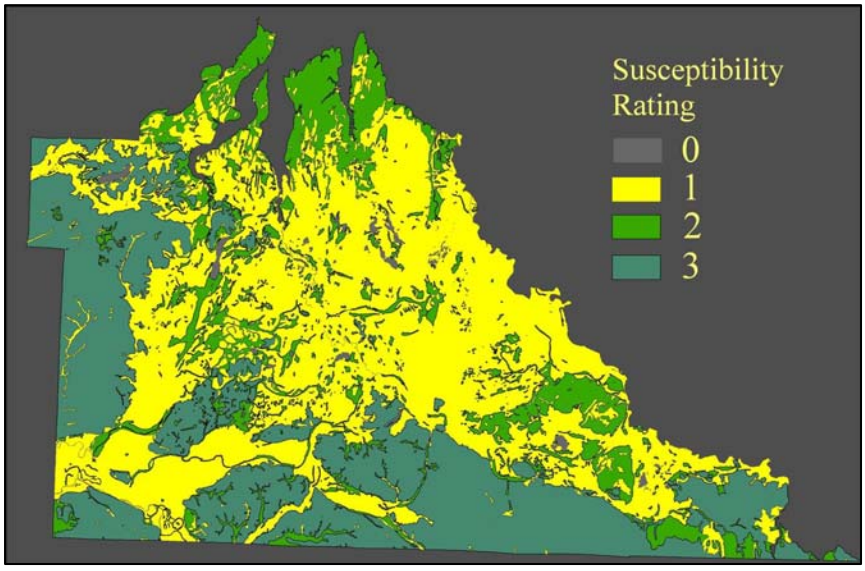
References – Who are some of the consultant's past clients? Are they satisfied customers? Call them and find out who they worked with from the consulting firm and how they liked working with them. Ask whether there were any problems that occurred during or after the project, how the consultant handled those problems, and what they charged for their work. You may also want to ask other government jurisdictions and agencies about their experiences working with a particular consultant.

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

Cost – How much will the consultant cost? Compare rates, but do not let cost be your sole criteria. Be sure to consider training, experience, and the other factors as well. A good consultant who charges you more may end up saving you money by reducing the likelihood of confusion, disagreements, and appeals in the future.

Critical Aquifer Recharge Areas Assistance

Critical aquifer recharge areas (CARAs) are those areas with a critical recharging effect on aquifers used for potable water. These areas are where an aquifer that is a source of drinking water is susceptible to potential contamination that would affect the potability of water. Existing nonconforming land uses critical aquifer recharge areas may increase the vulnerability of the aquifer to contamination (e.g., gas stations, auto repair, and metal finishing businesses) and should be addressed in the protection regulations.



Thurston County 1991 GIS Cover

State Technical Assistance

The Washington State Department of Ecology (Ecology) has primary responsibility for assisting local communities with issues related to critical aquifer recharge areas. Ecology regulates numerous activities that may be relevant to assessing and developing regulations for critical aquifer recharge areas including:

- Ground water contamination (hazardous and toxic wastes, solid waste facilities, underground injection control of dry wells).
- Water resources (well construction and siting, instream flow).
- Water quality (non-point pollution, land and water discharge permitting, stormwater management).

The Washington State Department of Agriculture administers the dairy waste program.

To help local jurisdictions meet the requirements of the GMA as it pertains to critical aquifer recharge areas, Ecology developed the Guidance Document for the Establishment of Critical Aquifer Recharge Area Ordinances (January 2005, Publication #05-10-028). The document focuses on the establishment of critical aquifer recharge area ordinances necessary to protect ground water quality, and ensure that sufficient aquifer recharge occurs to support ground water's use as a potable water source. The document provides information on several key areas within a local ordinance, including:

- How a local ordinance should integrate requirements from existing federal and state statutes and regulations related to ground water quality and quantity protection.
- What constitutes a technically valid determination of a critical aquifer recharge area boundary and, once a jurisdiction makes an initial determination, to what extent additional characterization should be required for a given activity.
- The types of land use activities that should be considered prohibited, provisional, or acceptable.
- What mitigation measures might allow an activity to continue yet afford the ground water adequate protection.

If you have any questions concerning the guidance document, contact:

Laurie Morgan
Water Quality Program
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
Phone: (360) 407-6483
FAX: (360) 407-6426
E-mail: lmor461@ecy.wa.gov

The Web site for the Ecology Water Quality Program is:
http://www.ecy.wa.gov/programs/wq/grndwtr/index.html.
The CARA guidance document may be found at Ecology's Publications Web site (http://www.ecy.wa.gov/biblio/97030.html). A copy may also be obtained by contacting Ecology's Publications office at (360) 407-7472 or e-mail at ecypub@ecy.wa.gov. Request Ecology Publication # 97-030.

Supplemental State Assistance

Washington State Department of Health

The Washington State Department of Health (DOH) implements the federal Safe Drinking Water Act, which includes the Source Water Protection Program. DOH can provide assistance relating to wellhead protection zones and contaminant inventories, as well as regulations associated with water quality, drinking water regulations, water conservation techniques, and possible funding of drinking water projects.

Washington Department of Health
Division of Drinking Water
P.O. Box 47828
7171 Cleanwater Lane, Building 8
Olympia, Washington 98504-7828
(360) 236-3100
http://www.doh.wa.gov/ehp/dw/default.htm

Washington State Department of Agriculture

The Washington State Department of Agriculture can provide information on dairy waste programs, pesticide use and registration, and the prevention of ground water contamination from pesticides.

Washington State Department of Agriculture – (877) 301-4555
http://agr.wa.gov/PestFert/default.htm

Local Conservation Districts

Local conservation districts may be able to provide site-specific resource information that will be useful in identifying the types of critical areas to be protected by regulations. Conservation districts work with landowners to improve natural resource protection, including water quality and ground water pollution prevention activities in the agricultural sector. Contact information for the 48 Washington conservation districts is listed on the Washington State Conservation Commission's Web site at http://www.scc.wa.gov/districts/list/.

Washington State Conservation Commission – (360) 407-6200
http://www.scc.wa.gov/

Washington Association Conservation Districts – (360) 757-1094
http://www.wacd.org/

U.S. Geological Survey

The U.S. Geological Survey (USGS) can provide a range of hydrologic data and information useful in managing water resources. Data relevant to identifying existing information on critical aquifer recharge areas could include collected ground water and surface water analysis, including publications pertaining to local resources and maps. The USGS can also initiate studies on an intra-jurisdictional basis.

U.S. Geological Survey – (253) 428-3600 x2653
http://wa.water.usgs.gov

Environmental Protection Agency

The Environmental Protection Agency (EPA) Region 10 may have relevant information pertaining to local ground water. The Ground Water Unit's mission is to protect the health of Northwest communities as well as their ecology by safeguarding ground water from pollution.

U.S. EPA Region 10 Ground Water Unit – (800) 424-4EPA
http://yosemite.epa.gov/R10/WATER.NSF

Geologist/Hydrogeologist Licensing Laws and Regulations

Department of Licensing Geology License Web site: http://www.wa.gov/dol/bpd/geofront.htm
Washington State Code Reviser Web site, with links to RCWs and WACs: http://slc.leg.wa.gov/
Both of the above Web sites have links to the Geologist Licensing laws and regulations: RCW 18.220 and WAC 308-15.

Washington State Department of Health Source Water Protection Program

The federal Safe Drinking Water Act includes provisions for preventing contamination of drinking water for Group A public water supply systems (15 or more connections). This program is administered in Washington state by the Washington State Department of Health. Information about this program is at: http://www.doh.wa.gov/ehp/dw/Our_Main_Pages/swap.htm.

Here is a quote from this Web site:

> The Source Water Assessment Program will result in an evaluation of the source water that provides drinking water to Group A public water systems in Washington state. This evaluation will estimate the degree to which a given public water source is at risk from contamination. Once completed, the assessment results will be used to assist local communities in targeting and implementing protection measures such as best management practices, zoning overlays, critical areas ordinances, and public education. The information can also be used to help focus technical assistance outreach efforts and compliance inspections.

Source Control

Chapter 173-200 WAC, Ground Water Quality Standards,
http://www.ecy.wa.gov/biblio/wac173200.html

Implementation Guidance for the Ground Water Quality Standards,
http://www.ecy.wa.gov/biblio/9602.html

Washington State Department of Ecology, 1992. Assessing the Impacts of Community Onsite Sewage Systems on Ground Water Quality, Part 2, Chapter VIII, *Water Quality Program Permit Writer's Manual*, Washington State Department of Ecology, Publication #92-109, revised 2001, http://www.ecy.wa.gov/biblio/92109.html, pages VIII-2 through VIII-8.

Chapter 173-303 WAC, Dangerous Waste Regulations,
http://www.ecy.wa.gov/biblio/wac173303.html

Washington State Department of Ecology Sand and Gravel General Permit,
http://www.ecy.wa.gov/programs/wq/sand/index.html

Delineation Methods

Garrigues, R.S. and K. Sinclair, J. Tooley, 1998. Chehalis River Watershed Surficial Aquifer Characterization, Washington State Department of Ecology Environmental Assessment Program Watershed Ecology Section, Publication #98-335, 22 pp.
http://www.ecy.wa.gov/biblio/98335.html

U.S. Environmental Protection Agency, 2000. Technical Assistance Document for Delineating Other Sensitive Ground Water Areas, EPA Office of Water, Publication Number 816-R-00-016, 22 pp. http://www.epa.gov/safewater/uic/tad_sensitive_gw.pdf

U.S. Environmental Protection Agency, 1993. A Review of Methods for Assessing Aquifer Sensitivity and Ground Water Vulnerability to Pesticide Contamination, EPA Office of Water, Publication No. 813-R-93-002, September 1993, 147 pp. + appendices.

Eastern Washington Studies

Whiteman, K.J., J.J. Vaccaro, J.B. Gonthier, and H.H. Bauer, 1994. The Hydrogeologic Framework and Geochemistry of the Columbia Plateau Aquifer System, Washington, Oregon, and Idaho. U.S. Geological Survey Professional Paper 1413-B, 73 pp.

Drost, B.W., S.E. Cox, and K.M. Schurr, 1997. Changes in Ground Water Levels and Ground Water Budgets, from Predevelopment to 1986, in Parts of the Pasco Basin, Washington: U.S. Geological Survey Water-Resources Investigations Report 96-4086, 172 pp.

On-line U.S. Geological Survey (USGS) publication index, Columbia Basin NAWQA:
http://wa.water.usgs.gov/pubs/

On-line USGS publication index, Yakima Basin NAWQA,
http://oregon.usgs.gov/projs_dir/yakima/pubs.html

Western Washington Studies

Vaccaro, J.J., A.J. Hansen, Jr., and M.A. Jones, 1998. Hydrogeologic Framework of the Puget Sound Aquifer System, Washington and British Columbia, Regional Aquifer System Analysis, U.S. Geological Survey Professional Paper 1424-D, 77 pp.

Garrigues, R.S., K. Sinclair, and J. Tooley, 1998. Chehalis River Watershed Surficial Aquifer Characterization, Washington State Department of Ecology Environmental Assessment Program Watershed Ecology Section, Publication #98-335, 22 pp.

Cox, S.E. and S.C. Kahle, 1999. Hydrogeology, Ground Water Quality, and Sources of Nitrate in Lowland Glacial Aquifers of Whatcom County, Washington, and British Columbia, Canada. U.S. Geological Survey Water-Resources Investigations Report 98-4195, 251 pp.

On-line USGS publication index, Puget Sound NAWQA, http://wa.water.usgs.gov/pubs/

Ground Water Quality Studies

Erickson, D. and D. Norton, 1990. Washington State Agricultural Chemicals Pilot Study, Final Report, Washington State Department of Ecology, Publication #90-46, 76 pp. + appendices.

Tesoriero, A.J. and F.D. Voss, 1995. U.S. Geological Survey. Models for Predicting the Occurrence of Elevated Nitrate Concentrations in Ground Water in the Puget Sound Basin. USGS FS-061-97.

Saltwater Intrusion

Washington State Department of Ecology Water Resources Program, 2002. Seawater Intrusion in Washington: What Does it Mean to Us?, Brochure, Ecology Publication #02-11-018, http://www.ecy.wa.gov/pubs/0211018.pdf

Impervious Surfaces

Booth, D.B., 2000. Forest Cover, Impervious-Surface Area, and the Mitigation of Urbanization Impacts in King County, Washington. Center for Urban Water Resources, University of Washington.

http://depts.washington.edu/cuwrm/

Database Sources

Washington State Department of Ecology On-Line:

- Facility/Site: http://www.ecy.wa.gov/services/as/iss/fsweb/fshome.html
  Facilities and sites that are regulated by the Department of Ecology.
- Toxic Cleanup Sites: http://www.ecy.wa.gov/programs/tcp/cscs/CSCSpage.HTM
- Leaking Underground Storage Tank sites: http://www.ecy.wa.gov/programs/tcp/ust-lust/tanks.html
- EIM: http://www.ecy.wa.gov/eim/
  Environmental Information Management System; sampling, measurements, and monitoring results. The link to query EIM on-line and download data is on this page.
- GIS home page: http://www.ecy.wa.gov/services/gis/index.html

USGS Washington State Bibliography On-Line

http://wa.water.usgs.gov/pubinfo/biblio.htm

This bibliography contains references to published reports, maps, journal articles, and proceedings related to the water resources of Washington state as published by the U.S. Geological Survey, or in cooperation with other federal or state agencies.

LaSpina, J. and R. Palmquist, 1992. Catalog of Contaminant Databases; A Listing of Databases of Actual or Potential Contaminant Sources. Washington State Department of Ecology. Publication #92-52.

Wetlands Assistance

Wetlands are areas inundated or saturated by surface water or ground water at a frequency or duration sufficient to support a prevalence of vegetation adapted to saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

State Technical Assistance

Wetlands specialists with the state Department of Ecology provide a range of technical assistance to local governments including development and implementation of local wetland programs. These staff have a good understanding of current scientific knowledge about wetlands as well as the practical aspects of wetland regulation. They can assist with developing and reviewing drafts of wetland regulations, participating in citizen advisory committees, and speaking at public meetings. It is very important to get their involvement early in your process.

Ecology also has produced a number of guidance documents that are useful to local governments developing wetlands programs. Existing documents can be obtained from Ecology's Web site at:

http://www.ecy.wa.gov/programs/sea/wetlan.html.

Or by contacting the Publications Office at (360) 407-7472.

In addition, Ecology's wetlands specialists are frequently involved in providing training on wetland issues to local government or state agency staff, and as time allows, conducts training or educational presentations for public organizations.

Washington State Department of Ecology, Wetlands
P.O. Box 47600, Olympia, WA 98504 Fax: (360) 407-7162
http://www.ecy.wa.gov/programs/sea/wetlands/index.html

Policy and Regulation: Andy McMillan (360) 407-7272
Senior Ecologist: Tom Hruby (360) 407-7274
Stewardship: Jane Rubey (360) 407-7258
Restoration: Stephen Stanley (360) 407-7296
GIS: Susan Grigsby (360) 407-7546
Mitigation Guidance Project: Patricia Johnson (360) 407-6140
or Dana Mock : (360) 407-6947
Best Available Science Project: Teri Granger (360) 407-6857
Isolated Wetlands: (800) 917-0043

Best Available Science for Freshwater Wetlands

Under the GMA, local governments must include the best available science when reviewing and revising their policies and regulations on wetlands. Ecology has developed new best available science documents on wetlands.
http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html

Update to Wetland Policy and Technical Mitigation Guidance

As a result of changes in its understanding of wetland science and management, Ecology, through a Wetland Program Development Grant from the U. S. Environmental Protection Agency (EPA), is preparing to update two of its publications. The updates are being done in coordination with the Seattle District Corps of Engineers and the EPA (Region 10). The two documents undergoing revision are:

How Ecology Regulates Wetlands, January 1997, Publication #97-112 (http://www.ecy.wa.gov/biblio/97112.html)

This document provides an overview of the role that Ecology plays in regulating wetlands and the factors that go into the agency's wetland permitting decisions. An updated version of this document will be available from Ecology's publications office and as a downloadable PDF file from the Web site sometime in 2004. For more information on this update, e-mail Andy McMillan or call at (360) 407-7272.

Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals, 1994, Publication #94-29 (http://www.ecy.wa.gov/programs/sea/pubs/94-029/94-029.html)

Additional information regarding Ecology's wetland programs, including education, function assessment, mitigation, regulations and permits, isolated wetlands, and stewardship, is available on Ecology's wetlands Web site: http://www.ecy.wa.gov/programs/sea/wetlands/index.html.

Frequently Flooded Areas Assistance

Frequently flooded areas are lands in the floodplain subject to a 1 percent or greater chance of flooding in any given year, including, but not limited to, streams, rivers, lakes, coastal areas, and wetlands.

Technical Assistance

Ecology has floodplain management specialists located in regional offices to address floodplain issues throughout the state: http://www.ecy.wa.gov/org.html. These staff provide a range of technical assistance to local governments, private citizens, builders, developers, surveyors, engineers, insurance and lending institutions, and other state and federal agencies.

Department of Ecology Floods Section
http://www.ecy.wa.gov/programs/sea/floods/index.html

Flood Insurance Rate Maps and Flood Insure Maps (FIRM or FIM) are the primary tools for identifying and locating frequently flooded areas. To obtain maps for your community, contact FEMA.

FEMA Map Service Center
(800) 358-9616
http://store.msc.fema.gov/

The most important element of technical assistance to local governments is in interpreting state and federal regulations that are required as part of local floodplain ordinances. Ecology staff regularly coordinates with and visits local communities to assess enforcement of local ordinances,

but they will also assist local officials and private citizens in interpretations regarding application of floodplain maps and regulations.

Program Development Assistance

Ecology floodplain management specialists can assist local governments in preparing floodplain ordinances that comply with the GMA, the FEMA National Flood Insurance Program (NFIP) regulations, and the State Floodplain Management law (RCW 86.16).

In addition to the Example Code Provisions included in Appendix A, a State Model Flood Damage Prevention Ordinance is available from Ecology. This model ordinance may be used to satisfy state and federal flood protection requirements. However, additional measures may be necessary to fully comply with the GMA requirement to protect critical areas. Local jurisdictions are encouraged to use the model flood ordinance in addition to critical areas recommendations to provide a balance of flood protection and preservation of ecological systems.

FEMA Region 10 has issued "Higher Regulatory Standards," which provides regulatory guidance for floodplain development, fish habitat protection, and stormwater management.

Local government staff is encouraged to call Ecology staff to obtain model floodplain ordinances and to receive assistance in floodplain ordinance adoption, and interpretation of floodplain regulations.

Permit Review Assistance

In reviewing development proposals requiring local approval, Ecology staff do not issue permits or have direct regulatory authority, but provide assistance as required by state law (RCW 86.16.031), and as required under an annual contract with the Federal Emergency Management Agency.

Most floodplain issues can be adequately addressed by a local jurisdiction's staff. However, there may be cases that can benefit from the assistance of an Ecology floodplain management specialist. This assistance is particularly important in smaller communities. Ecology staff from the regional offices can provide this assistance. For more information on Ecology floodplain activities, consult the Ecology Web site.

Geologically Hazardous Areas Assistance

Geologically hazardous areas are those areas that are susceptible to erosion, sliding, earthquake, or other geological events and are not suited to the siting of commercial, residential, or industrial development consistent with public health and safety concerns.[61]

Technical Assistance

For technical assistance regarding geologically hazardous areas, including earthquake and volcanic hazards, contact the Washington State Department of Natural Resources (DNR), Geology and Earth Resources Division.

Department of Natural Resources contact: Ron Teissere, Manager (360) 902-1450

[61] See RCW 36.70A.030 (9).

Information is also available from the DNR Web site.

http://www.dnr.wa.gov/geology/

The DNR Web site includes specific information on the following geological hazards:

Seismic – http://www.dnr.wa.gov/geology/hazards/equakes.htm
Landslides – http://www.dnr.wa.gov/geology/hazards/lslides.htm
Volcanoes – http://www.dnr.wa.gov/geology/hazards/volcano/
Tsunami – http://www.dnr.wa.gov/geology/hazards/tsunami.htm
Coal Mines Subsidence – http://www.dnr.wa.gov/geology/hazards/coalsub.htm

Erosion Hazards

The state Department of Ecology Shorelands and Environmental Assistance Program has information about Puget Sound shorelines, including information about wave erosion on marine beaches, land sliding of marine bluffs and tall river banks, and streambank erosion on rivers and other flow waters.

Ecology contact: Douglas J. Canning (360) 407-6780

For information about coastal erosion in the Puget Sound region:
http://www.ecy.wa.gov/programs/sea/landslides/maps/maps.html

The Natural Resources Conservation Service (NRCS) is a source of technical information for erosion. The state Web page for the NRCS is located at: http://www.nrcs.usda.gov/.

Seismic Hazards

The U.S. Geological Survey and the Pacific Northwest Seismograph Network are sources for technical information for earthquakes.

http://www.geophys.washington.edu/SEIS/PNSN/welcome.html

Fish and Wildlife Habitat Conservation Areas Assistance

Fish and wildlife habitat conservation areas include habitat areas for birds, fish, and animals. These areas include those lands that support endangered, threatened, and sensitive species, and species of local importance. Examples of fish and wildlife habitat conservation areas include shellfish areas, kelp and eelgrass beds, spawning areas, ponds, lakes and streams, caves, large forested tracts, and areas planted with game fish by a governmental or tribal entity.

Technical and Program Assistance

The Washington Department of Fish and Wildlife (WDFW) has regional biologists that work with GMA and Priority Habitat and Species (PHS) issues. These regional biologists and other area habitat biologists are available to provide a wide range of technical assistance to local governments in the identification of fish and wildlife habitat conservation areas and in the

development of both nonregulatory and regulatory measures to provide protection to these valuable resources.

Washington Department of Fish and Wildlife
Habitat Program
(360) 902-2534
http://wdfw.wa.gov/habitat.htm
E-mail: habitatprogram@dfw.wa.gov

In addition to staff located in Olympia, there are six WDFW Regional Offices located across the state in Spokane, Ephrata, Yakima, Mill Creek, Vancouver, and Montesano. The contact information for these regional offices is listed below. Most services are provided through the habitat programs within each of these regions with support from staff in Olympia as well as other programs within the regions and headquarters.

The area habitat biologists are able to help local governments identify which priority species are located within their jurisdictions and where they may be located. They are able to provide priority habitat and species maps that aid in the identification of not only where the species may be found but also habitat that is important to be protected for these species' well being and survival.

WDFW biologists are also a resource for identification of species of local importance and measures that may be taken to protect them. Local governments are encouraged to contact the WDFW regional office nearest their jurisdiction to obtain technical assistance on these and other matters related to fish and wildlife habitat conservation areas.

Permit Review Assistance

WDFW staff are available to assist in the review of local permits through the SEPA process. They will be able to provide information related to mitigation measures that may be used to protect critical areas within a local jurisdiction.

WDFW staff also administers the Hydraulic Code, which requires approval of projects that are conducted within the ordinary high water marks of waters of the state for work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state. This regulatory program provides conditions to projects that may impact fish life and habitat. For more information on the Hydraulic Code, consult the WDFW Web site.

Eastern Washington - Region 1
Telephone (509) 456-4082
Fax (509) 456-4071

North Central Washington - Region 2
Telephone (509) 754-4624
Fax (509) 754-5257

South Central Washington - Region 3
Telephone (509) 575-2740
Fax (509) 575-2474

North Puget Sound - Region 4
Telephone (425) 775-1311
Fax (425) 338-1066

Southwest Washington - Region 5
Telephone (360) 696-6211
Fax (360) 906-6776

Coastal Washington - Region 6
Telephone (360) 249-4628
Fax (360) 664-0689