

Chapter 2. Designating and Protecting Critical Areas:
Guidance and Resources
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Table of Contents

Designating and Protecting Critical Areas.....	4
Designating and Protecting Wetlands	6
Sources of Wetlands Science and Management Recommendations	6
Special Consideration for Anadromous Fisheries	7
Court and Growth Management Hearings Board Decisions.....	8
Designating and Protecting Fish and Wildlife Habitat Conservation Areas.....	10
Sources and Methods for Designation.....	12
Federal and State Endangered, Threatened and Sensitive Species.....	12
Habitats and Species of Local Importance.....	13
Shellfish Areas.....	13
Kelp and Eelgrass Beds; Forage Fish Spawning Areas.....	14
Naturally Occurring Ponds	14
Waters of the State	14
Stream Mapping and Stream Typing	15
Lakes and Rivers Stocked with Fish.....	16
Natural Area Preserves, Natural Resource Conservation Areas and State Wildlife Areas	17
Protecting Fish and Wildlife Habitat Conservation Areas.....	17
Special Consideration for Anadromous Fisheries	18
Growth Management Hearings Board Decisions.....	19
Designating and Protecting Frequently Flooded Areas	22
Sources and Methods for Designation and Protection.....	22
Floodplains by Design	23
Special Consideration for Anadromous Fisheries	23
FEMA Guidance on National Marine Fisheries Service Puget Sound Biological Opinion	24
Growth Management Hearings Board Decisions.....	25
Designating and Protecting Geologically Hazardous Areas	26
Sources for Designation	27
Special Consideration for Anadromous Fisheries	27
Growth Management Hearings Board Decisions.....	28
Designating and Protecting Critical Aquifer Recharge Areas.....	30
Important Considerations for Designating Critical Aquifer Recharge Areas	31

Characterize Hydrogeologic Susceptibility.....	31
Evaluate Potential Contaminant Loading Risk Factors	31
Classification Strategy	32
Example Tools That Help in Evaluating, Classifying, and Designating Critical Aquifer Recharge Areas	32
Growth Management Hearings Board Decisions Regarding Designation	33
Other Ground Water Protection Programs	34
Salt Water Intrusion in Coastal Fresh Water Aquifers	35
Growth Management Hearings Board Decisions.....	36
Special Consideration for Anadromous Fisheries	37

Designating and Protecting Critical Areas

Local governments are required to do two things to comply with the Growth Management Act: (1) designate critical areas; and (2) protect their functions and values. In doing so, they must include the best available science, and must give special consideration to anadromous fish.¹

Designating critical areas is an important part of a successful critical areas protection program. 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 are required to consider the minimum guidelines established pursuant to RCW 36.70A.050. This chapter discusses the minimum guidelines for each type of critical area in a little more detail. Most importantly, this chapter provides references and links to sources of best available science and management recommendations for each type of critical area. Counties and cities reviewing their critical area regulations for possible updates should consult the critical areas checklist and the Commerce Critical Areas web site for updated links to those resources², as well as this handbook.

The Guidelines reference the statutory requirement to include best available science, and recommend that counties and cities designate critical areas using maps and performance standards.³ Designation is usually done with a map such as a zoning map. However, there is not usually enough on-the-ground information to do an effective job of designating critical areas using this method. Critical areas designation is typically done through performance standards. The term “performance standards” means the criteria or characteristics of the land that determine that it is a critical area.⁴ Even so, rough mapping of critical areas for information purposes is advisable because it raises awareness and can be useful for triggering site scale analysis.

The adoption of performance standards provides a way to designate critical areas without requiring a prohibitively expensive inventory and mapping before the requirements for protecting the critical area would apply. Instead, the legislative act of designation is the adoption of criteria, or performance standards, that are used to determine a particular area is a critical area by applying the criteria on the ground. This typically happens during local project review. For example, the criteria may identify characteristics such as the presence of certain plant communities or the presence of hydric soils as performance standards indicating a wetland. Determining the exact location of the boundary only occurs through a delineation process during the site investigation associated with development. The National Wetlands Inventory map shows some but not all wetlands. The duty to protect wetlands exists regardless of whether a particular wetland is in on the National Wetland Inventory.

All areas meeting the definition of one or more critical area type, regardless of any formal identification, are required to be designated critical areas. Resources for designating each type of critical area are provided below. Examples of code language to define and designate critical areas [will be] available on the Commerce web site.

¹ RCW 36.70A.172

² See the [Commerce Growth Management Critical Areas web page](#).

³ WAC 365-190-080(3) and (4)

⁴ WAC 365-190-040(5), WAC 365-190-080(4)

All critical areas in all counties and cities must be designated. There are no exemptions, exclusions, or limitations to this requirement. The growth management hearings boards have consistently held that local governments must designate and protect all five categories of critical areas present within the boundaries of their jurisdiction. This mandate applies equally to urban, rural, and resource lands. The Growth Management Act does not discriminate; it simply requires that their functions and values be protected wherever they are found.⁵

⁵ *Pilchuck Audubon Society, et al v. Snohomish County*, 06-300015c, September 15, 2006. See Appendix 1.B for a more comprehensive summary of case law on this topic.

Designating and Protecting Wetlands

Wetlands are fragile ecosystems that serve a number of important beneficial functions. Wetlands reduce the impacts 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](#)(21)⁶:

[A]reas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands.

WAC 173-22-035 requires that identification of wetlands and delineation of their boundaries be done in accordance with the approved federal wetland delineation manual and application regional supplements. Counties and cities are encouraged to make their actions consistent with the intent and goals of “protection of wetlands”, Executive Orders 89-10 and 90-04, as they existed on September 1, 1990.⁷

Sources of Wetlands Science and Management Recommendations

A key resource for reviewing and updating wetlands designation and protection provisions is the Washington Department of Ecology’s [GMA and Local Wetland Regulations web page](#).⁸ The web page provides a comprehensive synthesis of the science regarding freshwater wetlands by the State Departments of Ecology (Ecology) and Fish and Wildlife (WDFW) to assist local governments (March 2005). And, there are guidance publications for counties and cities regarding protecting and managing wetlands (April 2005 and June 2016), and wetlands mitigation (March 2006)⁹.

Because wetland functions vary widely, counties and cities have been encouraged to develop a wetlands rating system to determine what functions should be protected. Counties and cities that do not now rate wetlands should consider a wetlands rating system to reflect the relative function, value, and

⁶ Amended in 2012.

⁷ WAC 365-190-090(2)

⁸ <https://ecology.wa.gov/Water-Shorelines/Wetlands/Regulations/Local-regulations>

⁹ Note: The mitigation guidance is being revised and will be published in late 2018.

uniqueness of wetlands in their jurisdictions. In developing wetlands rating systems, counties and cities should consider using the wetland rating system developed by the Department of Ecology (Ecology).¹⁰

If a county or city chooses not to use the state wetlands rating system, the rationale for that decision needs to be included in its legal record and it must include best available science. A rating system should evaluate, at a minimum, the following factors:

- Wetlands functions and values;
- Degree of sensitivity to disturbance;
- Rarity;
- The degree to which a wetland contributes to functions and values of a larger ecosystem. Rating systems should generally rate wetlands higher when they are well-connected to adjacent or nearby habitats, are part of an intact ecosystem or function in a network of critical areas; and
- The ability to replace the functions and values through compensatory mitigation.¹¹

Counties and cities may use the National Wetlands Inventory as an information source to determine 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 additional information about marine and estuarine shoreline wetland modification issues go to the [Aquatic Habitat Guidelines web page](#).¹²

Contact information for Ecology wetlands specialists is also available on the Ecology [GMA and Local Wetland Regulations web page](#)¹³ if you have a specific question.

Special Consideration for Anadromous Fisheries

Wetland buffers protect water quality and flow regime, and provide habitat structure and a source of food for fish. Ecology's 2014 updated wetlands rating system guidance for [Eastern](#) and [Western](#) Washington discuss the influence of forested wetlands.¹⁴ They influence channel form, and create pools, riffles, and side channels that are essential habitat for many fish and other aquatic species. The guidance also notes that wetlands with streams running through them in the Puget Sound area and on the Columbia River will probably be providing habitat for one or more species of threatened or endangered fish.

Wetlands are identified as a priority habitat by WDFW for salmonids in every county in the state.¹⁵ Wetlands and associated vegetation provide essential off-channel habitat to sustain young salmonid growth and protect them from predators. Wetland habitat also hosts amphibious species and insects

¹⁰ WAC 365-190-090(3)(b). See Ecology's [GMA and Local Wetland Regulations web page](#) for the 2014 updates to the Washington State Wetlands Rating System for Western Washington and Eastern Washington, respectively.

¹¹ WAC 365-190-090(3)(c)

¹² <https://wdfw.wa.gov/conservation/habitat/planning/ahg/>

¹³ <https://ecology.wa.gov/Water-Shorelines/Wetlands/Regulations/Local-regulations>

¹⁴ <https://ecology.wa.gov/Water-Shorelines/Wetlands/Regulations/Local-regulations>

¹⁵ WDFW [Priority Habitats and Species List](#).

that are potential food sources for salmonids. Wetlands moderate stream flows by preserving adequate water recharge to streams during low flow periods and protect rearing salmonids from the effects of high flows. Consequently, WDFW recommends adhering to Ecology guidance for identifying, classifying and protecting wetlands.¹⁶

Court and Growth Management Hearings Board Decisions

The Court of Appeals, Division 3, found that Yakima County failed to justify its departure from best available science in allowing administratively approved wetland buffers of 25 feet in an update to its critical areas ordinance. Yakima County adopted standard buffers and adjusted minimum stream and wetland buffers. The ordinance was challenged for failure to include best available science and failure to protect all the functions and values of the critical areas as required by RCW 36.70A.172. Almost all of the scientific studies reviewed by the County recommended buffers greater than those adopted by the County. The Court found that the GMA requires that regulations for critical areas must protect all functions and values of the designated areas and not just some. The Court noted that the vast majority of best available science included in the decision making process recommended much larger minimum buffers and the County gave no basis in its review for the reduction and also didn't require individual adjustments to be based on best available science.¹⁷

The Eastern Washington Growth Management Hearings Board found that Ferry County failed to protect the functions and values of wetlands. The County chose to protect wetlands using the Department of Ecology's Buffer Alternative 3, which is "[W]idth based on wetland category, intensity of impacts, and wetland functions or special characteristics." The intensity of impacts criteria, which are directly related to the frequency and duration of disturbance, is a key component of Alternative 3. By allowing high impact agricultural activities and residential use in its low intensity wetland areas, the County failed to protect the functions and values of wetlands, and failed to provide any reasoned justification, such as scientific-based information, to depart from the DOE's land use recommendations for Low Intensity Land Use.¹⁸

The Central Puget Sound Growth Management Hearings Board upheld the City of Seattle's decision to allow development impacts to Category IV wetlands (the most degraded) of less than 100 square feet without buffers if they are mitigated by on-site replacement, bioswales, revegetation, or roof gardens.¹⁹ In *Hood Canal*²⁰, the Board acknowledged the potential disproportionality of requiring buffers as the means of protecting functions of the smallest, most degraded wetlands. *Hood Canal*, at 19, fn. 23. The Board noted that other mitigating strategies, such as best management practices or compensatory on-site or off-site mitigation might be scientifically supported. Here, Seattle opted for alternative protection mechanisms for these limited cases of small, isolated, low-functioning wetlands. The Board found the Petitioners had not carried their burden of proving that the City's regulations for small Category IV wetlands are clearly erroneous.

¹⁶ WDFW [Land Use Planning for Salmon, Steelhead and Trout](#), page 55.

¹⁷ *Yakima County v. Eastern Washington Growth Management Hearings Board*, 168 Wn. App. 680 (2012).

¹⁸ *Concerned Friends of Ferry County/Robinson v. Ferry County*, 06-1-0003, 2nd Compliance Order, March 17, 2009, p.19.

¹⁹ *Seattle Audubon Society, et al v. City of Seattle*, 06-3-0024, FDO, December 11, 2006, p.24.

²⁰ *Hood Canal Environmental Council, et al v. Kitsap County*, 06-3-0012c, FDO, August 28, 2006.

The Central Puget Sound Hearings Board found the City of Kent's wetlands regulations out of compliance. The Board held that, in designating critical areas, cities and counties "shall consider" the minimum guidelines promulgated by [Commerce] in consultation with Department of Ecology pursuant to RCW 36.70A.050(1) and (3); .170(2). In particular, wetlands "shall be delineated" pursuant to the Department of Ecology manual. RCW 36.70A.175.²¹ Expanding the statutory exemption results in a failure of accurate designation and, thus, a failure to protect the functions and values of these critical areas, as required by RCW 36.70A.172(1).²²

The Central Board held that the petitioners had met their burden of proof by demonstrating that the City of Kent's record lacks a current scientific basis for its wetlands rating system and that the three tier system is designed "with specific and narrow functions in mind," rather than protecting "the entirety of functions" of the City's wetlands. The Board did not find in the City's record any current science supporting the truncated wetland rating system or indicating how wetland functions will be identified and protected with this system.²³

The Board found that the complexity of wetlands protection is a function of the interplay between land uses, the specific wetland functions at risk, the degree of effectiveness, and other factors that might be more accurately assessed on a case-by-case basis. Where prescriptive regulation is enacted, a first step is designing a ranking system that reflects the full range of wetland functions and so addresses the protection of all functions.²⁴

Kitsap County exempted from regulation very small, truly isolated and poorly functioning wetlands. The County was advised by state agencies that such exemptions were not supported by best available science. The Central Puget Sound Board reviewed the case of *Clallam County v. Western Washington Growth Management Hearings Board*, 130 Wash. App. 127, 140, 121 P.3d 764 (2005), pertaining to the limitations on exemptions from critical areas regulations. The Board read the Court's opinion to require critical areas ordinance exemptions to be supported by some analysis of cumulative impacts and corresponding mitigation or adaptive management. Here, Kitsap County had not expanded its small wetlands exemption; in fact the exemption had been somewhat narrowed. But the Board found no evidence in the record of the likely number of exempt wetlands, no cumulative impacts assessment or adaptive management, and no monitoring program to assure no net loss. In light of the Court's guidance in *Clallam County*, which the Board found controlling, the Board found Kitsap's wetland exemption clearly erroneous.²⁵

²¹ *Department of Ecology/Department of Community, Trade and Economic Development, et al v. city of Kent*, 05-3-0034, FDO (April 19, 2006), at 10.

²² *Id.*, at 26.

²³ *Id.*, at 33.

²⁴ *Id.*, at 39.

²⁵ *Hood Canal Environmental Council, et al v. Kitsap County*, 06-3-0012c, FDO, August 28, 2006, p. 19-20.

Designating and Protecting Fish and Wildlife Habitat Conservation Areas

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 to ensure sufficient habitat quality, quantity, and connectivity to support long term, viable populations of fish and wildlife species and prevent the creation of isolated subpopulations within their natural geographic distribution. This does not mean maintaining all individuals of all species at all times, but it does mean not degrading or reducing populations or habitats so that they are no longer viable over the long term. Counties and cities should engage in cooperative planning and coordination to help assure long term population viability.²⁶ Fish and wildlife habitat conservation areas contribute to the state's biodiversity and occur on both publicly and privately owned lands.

Fish and wildlife habitat conservation areas are areas that serve a critical role in sustaining needed habitats and species for the functional integrity of the ecosystem, and which, if altered, may reduce the likelihood that the species will persist over the long term. These areas may include, but are not limited to, rare or vulnerable ecological systems, communities, and habitat or habitat elements including seasonal ranges, breeding habitat, winter range, and movement corridors; and areas with high relative population density or species richness.²⁷ Designating these areas is an important part of land use planning for appropriate development densities, urban growth area boundaries, open space corridors, and incentive-based land conservation and stewardship programs.²⁸

Fish and wildlife habitat conservation areas do not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of, and are maintained by, a port district or an irrigation district or company.²⁹ It should be noted that this definition only applies to fish and wildlife habitat conservation areas, and only applies to artificial features or constructs. Many naturally occurring features have been modified or adapted to serve irrigation and drainage purposes, but are still naturally occurring water courses. Also, artificial water courses that pass through, or originate in, regulated wetlands have the potential to negatively impact regulated habitat and critical area functions.

WDFW defines "watercourse", "river", or "stream" for the purpose of hydraulic permit applications in the hydraulic code rules.³⁰ Planners should work with WDFW regional habitat biologists to address this issue in their regulations. For example, Island County has defined "regulated water courses" and "non-regulated" water courses in their critical areas regulations.³¹

The Minimum Guidelines were updated in 2012 to provide more guidance for designating fish and wildlife habitat conservation areas. WAC 365-190-130 provides:

²⁶ WAC 365-190-130(1)

²⁷ WAC 365-190-030(6)(a)

²⁸ Id.

²⁹ RCW 36.70A.030(5)

³⁰ [WAC 222-660-030](#)(34) defines "ditch", and (153) defines "watercourse", "river", or "stream".

³¹ [ICC 17.02B.060](#)

Fish and wildlife habitat conservation areas that must be considered for classification and designation include:

- Areas where endangered, threatened, and sensitive species have a primary association;
- Habitats and species of local importance, as determined locally;
- Commercial and recreational shellfish areas;
- Kelp and eelgrass beds; herring, surf smelt, and other forage fish 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; or
- State natural area preserves, natural resource conservation areas, and state wildlife.³²

When classifying and designating fish and wildlife habitat conservation areas, counties and cities must include the best available science as described in Chapter 365-195 WAC. Counties and cities should consider the following:

- Creating a system of fish and wildlife habitat with connections between larger habitat blocks and open spaces, integrating with open space corridor planning where appropriate;
- The 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, including salmonid habitat, which also include marine shoreline areas;
- Evaluating land uses surrounding ponds and fish and wildlife habitat areas that may negatively impact these areas, or conversely that may contribute positively to their function;
- Establishing buffer zones around these areas to separate incompatible uses from the habitat areas.³³

Finally, counties and cities may also consider when designating these areas:

- Potential for restoring lost and impaired salmonid habitat;
- Potential for designating areas important for local and ecoregional biodiversity; and
- Establishing or enhancing non-regulatory approaches in addition to regulatory methods to protect fish and wildlife habitat conservation areas.³⁴

³² WAC 365-190-130(2). A 2015 update of WDFW's Hydraulic Code Rules also identifies "saltwater habitats of special concern" ([WAC 220-660-320](#)).

³³ WAC 365-190-130(3)(a)

³⁴ WAC 365-190-130(3)(b)

Sources and Methods for Designation

While the designation of fish and wildlife habitat conservation areas is required, how to go about designation is within the local jurisdiction's discretion. Jurisdictions have several sources of scientifically sound information to aid with this decision. Some suggestions are outlined below.

Federal and State Endangered, Threatened and Sensitive Species

Counties and cities should identify and classify seasonal ranges and habitat elements where 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 persist over the long term.³⁵ Federal and state resources for listed species include:

- The US Fish and Wildlife Service (USFWS) provides links for federally listed endangered and threatened species by county:
 - Designated “critical habitat”, recovery plans, and other resources;³⁶
 - Information for Planning and Consultation (IPaC) tool provides site-specific management recommendations;³⁷ and
 - Information about federally listed plant species.³⁸
- The National Oceanic and Atmospheric Administration (NOAA) Fisheries provides links to:
 - Listed species (salmon, marine mammals, marine turtles);³⁹
 - Maps;⁴⁰ and
 - Salmon recovery plans.⁴¹
- WDFW provides links for Washington State listed endangered, threatened and sensitive species:
 - WDFW's Species of Concern web page;⁴²
 - Species' status reports;⁴³
 - Recovery plans;⁴⁴ and

³⁵ WAC 365-190-130(4)(a)

³⁶ <https://www.fws.gov/endangered/>

³⁷ <https://ecos.fws.gov/ipac/location/index>

³⁸ <https://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?state=WA&status=listed>

³⁹ http://www.westcoast.fisheries.noaa.gov/protected_species/species_list/species_lists.html

⁴⁰ http://www.westcoast.fisheries.noaa.gov/maps_data/maps_and_gis_data.html

⁴¹ http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/index.html .

⁴² <http://wdfw.wa.gov/conservation/endangered/>

⁴³ <https://wdfw.wa.gov/publications/search.php?Cat=Threatened%20and%20Endangered%20Species&SubCat=Status%20Reports>

⁴⁴ <https://wdfw.wa.gov/publications/search.php?Cat=Threatened%20and%20Endangered%20Species&SubCat=Recovery%20Plans>.

- Current information on Priority Habitats and Species (which includes listed species) on the Priority Habitat and Species (PHS) web page.⁴⁵
- The [Governor’s Salmon Recovery Office and Recreation and Conservation Office](#) website provides links to recovery plans, monitoring efforts, policies, and the lead entities that coordinate salmon recovery locally.⁴⁶

Habitats and Species of Local Importance

Counties and cities should identify, classify and designate locally important habitats and species. Counties and cities should consult current information on priority habitats and species identified by the WDFW in the [Priority Habitat and Species \(PHS\) Program](#).⁴⁷ Priority habitat and species information includes endangered, threatened and sensitive species, as well as candidate species and other vulnerable and unique species and habitats. While the inclusion of species and habitats in the PHS Program reflects the priorities of the WDFW, they should be considered by counties and cities because they include the best available science. The WDFW can also provide assistance with identifying and mapping important habitat areas at various landscape scales. WDFW’s PHS Program identifies “Priority Habitats” and “Priority Species” throughout the state, and provides county-by-county lists, maps, management recommendations and technical advice regarding Fish and Wildlife Habitat Conservation Areas.

The Washington State Department of Natural Resources’ (WDNR) Natural Heritage Program can provide a list of high quality ecological communities and systems and rare plants.⁴⁸

Shellfish Areas

All public and private tidelands or bedlands suitable for shellfish harvest shall be classified as critical areas. 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.⁴⁹

Shellfish maps are available from various state agencies as follows:

- Shellfish safety/water quality;⁵⁰
- Recreational shellfish beaches;⁵¹

⁴⁵ <https://wdfw.wa.gov/conservation/phs/>

⁴⁶ https://www.rco.wa.gov/salmon_recovery/gfro.shtml

⁴⁷ <https://wdfw.wa.gov/conservation/phs/>

⁴⁸ <https://www.dnr.wa.gov/natural-heritage-program>

⁴⁹ WAC 365-190-(4)(c)

⁵⁰ <https://fortress.wa.gov/doh/eh/maps/biotoxin/biotoxin.html>

⁵¹ <https://wdfw.wa.gov/fishing/shellfish/beaches/>

- Commercial shellfish beds;⁵²
- Beach list by county;⁵³
- Shellfish Protection Districts (description, map);⁵⁴ and
- Razor clam beaches⁵⁵.

Kelp and Eelgrass Beds; Forage Fish Spawning Areas

Counties and cities must classify kelp and eelgrass beds identified by the WDNR and Ecology. Though not an inclusive inventory, Ecology publishes locations of kelp and eelgrass beds. Site-specific locations of kelp and eelgrass beds can be gathered using WDFW's survey methods found in Hydraulic Code Rules ([WAC 220-660-350](#)), which was updated in 2015.

Counties and cities must also classify forage fish spawning areas identified by WDFW. WDFW, using mapping protocols revised in 2014, maps sand lance, smelt, and herring spawning areas.⁵⁶ Site-specific locations of forage fish spawning areas can be gathered using 2011 WDFW's survey methods.⁵⁷

Naturally Occurring Ponds

Naturally occurring ponds under twenty acres and the associated submerged aquatic beds that provide fish or wildlife habitat must be designated as critical areas. These ponds typically provide habitat for amphibians that breed in still waters. Naturally occurring ponds do not include ponds deliberately designed and created from dry sites, such as canals, detention facilities, wastewater treatment facilities, farm ponds, 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.⁵⁸

Waters of the State

Waters of the state are defined in RCW [90.48.020](#) and include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses in Washington. Inclusion of waters of the state recognizes the critical role water plays in ecosystem functions and values. When classifying waters of the state as fish and wildlife habitat conservation areas, broad, landscape level functions should be considered, including development densities, run-off from

⁵² <https://fortress.wa.gov/doh/eh/maps/OSWPViewer/index.html>

⁵³ https://wdfw.wa.gov/fishing/shellfish/beaches/beach_names.php

⁵⁴ <https://www.doh.wa.gov/CommunityandEnvironment/Shellfish/GrowingAreaRestoration/ShellfishProtectionDistrictsLibrary>

⁵⁵ https://wdfw.wa.gov/fishing/shellfish/razorclams/graphics/map_beaches.jpg

⁵⁶ <http://wdfw.maps.arcgis.com/home/item.html?id=19b8f74e2d41470cbd80b1af8dedd6b3>

⁵⁷ https://wdfw.wa.gov/conservation/research/projects/marine_beach_spawning/training/protocol-field_bulk_sample_collection.pdf

⁵⁸ WAC 365-190-130(4)(e)

impervious areas, the effects of clearing and vegetation removal, and the interaction between surface and ground waters.

The following factors should be considered when classifying waters of the state as fish and wildlife habitat conservation areas:

- Species present which are endangered, threatened or sensitive, and other species of concern;
- Species present which are sensitive to habitat manipulation (e.g., Priority Habitats and Species program);
- Historic presence of species of local importance;
- Existing surrounding land uses that are incompatible with salmonid habitat;
- Condition and size of riparian ecosystems;
- Existing water rights; and
- The intermittent nature of some waters of the state.

Local governments should also consider the interaction between related critical areas such as critical aquifer recharge areas, frequently flooded areas, and wetlands. These designations can, and frequently do, overlap.

Stream Mapping and Stream Typing

There are currently two systems for mapping freshwater bodies in Washington. The National Hydrography Dataset (NHD) is the Washington State hydrography standard. Ecology is the curator for NHD-using national standards established by USGS.⁵⁹ This dataset is used for assigning reach “addresses” to streams and other waterbodies, which can be used to determine upstream/ downstream relationships. Because NHD is the national standard, these “addresses” can be shared easily among national, state, and local organizations. Local entities who want to create high-resolution NHD (1:24,000 or 1:4,800 scale) should contact Ecology. Within the Skagit River Basin, Ecology has created a beta version of NHD that includes Water Types (e.g., Type S, Type F) for uses not governed by Forest Practices rules.⁶⁰

The second system for mapping waters in the state was created for forest practice activities and is maintained by WDNR’s Forest Practices Division. This hydrology layer, which is most accurate in forested areas, is available.⁶¹ Local governments that use WDNR water type maps for regulating land uses should do so with extreme care as these maps may not capture accurate stream types or locations (e.g., missing and mis-located streams) outside of forested areas. Local governments should field-verify stream presence/locations and, if the stream is shown as non-fish bearing (i.e., Type Np or Ns), this should also be field-verified. WDFW habitat biologists are able to help with stream typing (this is the preferred way to verify stream types); alternatively a qualified biologist can apply WDNR’s current stream classification methodology.

⁵⁹ http://geo.wa.gov/datasets/b5a20ceaa6114e28b688d4236b417b2b_1

⁶⁰ NHD metadata at <https://www.arcgis.com/home/item.html?id=b5a20ceaa6114e28b688d4236b417b2b>

⁶¹ <http://data-wadnr.opendata.arcgis.com/datasets/wa-hydrography-watercourses>

WDNR's water typing system has been under review by the Forest Practices Board for the past several years. In December 2006, the Forest Practices Board adopted an interim water typing system that transitioned from a mapping system that used numbers (i.e., Type 1 through Type 5) to the lettering system shown below. Although the Forest Practices Board has not officially adopted a permanent water typing rule (or accompanying protocols for determining stream types), the interim system is the preferred method. The interim water typing classification system is described in [WAC 222-16-030](#) and [031](#). Guidelines for determining fish use can be found in [Section 13 of the Forest Practices Board Manual](#) (dated February 2002).

As of the writing of this document, the Forest Practices Board is developing a permanent rule and Board Manual for field protocols to determine where the potential habitat break for fish is located. When these protocols are adopted they will be placed in [Section 23 of the Forest Practices Board Manual](#).

Interim Stream Typing Symbolology	Old Stream Typing Symbolology
Type "S" (for Shoreline)	Type 1
Type "F" (for Fish)	Type 2 and 3
Type "Np" (for Non-fish, perennial)	Type 4
Type "Ns" (for Non-fish, seasonal)	Type 5

For a copy of the complete Forest Practices Rules and the Board Manual Guidelines, visit the [DNR Forest Practices web site](#).⁶²

Lakes and Rivers Stocked with Fish

This category includes waterbodies where game fish are stocked under the auspices of a federal, state, or local government, or tribal program. Every year WDFW stocks lakes, ponds, rivers, and streams throughout the state with millions of trout, kokanee, and steelhead. Resources include:

- Maps of WDFW-stocked lowland lakes;⁶³
- Maps of high lakes;⁶⁴
- The most recent county-by-county list of the more than 500 lakes, rivers, and streams across the state that WDFW stocks with trout and kokanee;⁶⁵
- Information about steelhead stocking;⁶⁶

Fifty-one tribal hatcheries and ten federal hatcheries also produce fish that are planted in Washington lakes and rivers. Local governments should consider establishing land use protections to sustain the economic, ecological, and social benefits provided by fisheries enhancement efforts. Fish hatchery information includes:

⁶² <https://www.dnr.wa.gov/about/boards-and-councils/forest-practices-board/forest-practices-rules-and-board-manual-guidelines>

⁶³ <https://wdfw.wa.gov/fishing/washington/lowland.html>

⁶⁴ <https://wdfw.wa.gov/fishing/washington/highlakes/stocking.php>

⁶⁵ <https://wdfw.wa.gov/fishing/plants/statewide/>

⁶⁶ <https://wdfw.wa.gov/fishing/plants/steelhead/>

- A list of USFWS fish hatcheries (with contact information);⁶⁷ and
- The Northwest Power and Conservation Council's map of artificial production programs operated by tribes and others.⁶⁸

Natural Area Preserves, Natural Resource Conservation Areas and State Wildlife Areas

Fifty-six Natural Area Preserves, totaling some 38,300 acres, and 36 Natural Resource Conservation Areas, totaling some 118,700 acres, are defined, established, and managed by DNR under the [Natural Heritage Program](#).⁶⁹ These areas should be designated as critical areas. Resources include:

- A county-by-county list of Natural Area Preserves;⁷⁰ and
- Natural Resource Conservation Areas.⁷¹

WDFW owns nearly one million acres in 32 State Wildlife Areas. A county-by-county list of State Wildlife Areas is available.⁷² These areas should also be designated as critical areas.

Protecting Fish and Wildlife Habitat Conservation Areas

Protection of fish and wildlife habitat conservation areas does not need to prohibit all uses, protect all individuals, or be applied uniformly across the landscape. Protection must, however, use best available science and conserve the ecological functions and values necessary to sustain viable populations of species such that subpopulations are not created.⁷³ Protecting these areas may require considering ecosystem functions at a broader scale; cooperative and coordinated land use planning among counties and cities in a region can be critically important for conserving some fish and wildlife species.

Conserving fish and wildlife habitat conservation areas' ecological functions typically involves maintaining habitat connectivity, quality, and quantity. The specific characteristics that provide for highly functional habitat varies from species to species. Some species, for example, have evolved to prefer edges of forests while others rely on forest interiors; some species are very tolerant of people while others only persist when human disturbances are minimal. Local government efforts to protect Fish and Wildlife Habitat Conservation Areas should follow the standard mitigation sequence of first avoiding impacts, second minimizing unavoidable impact, and third providing compensatory mitigation for all unavoidable impacts.

⁶⁷ <https://www.fws.gov/Fisheries/nfhs/facilities/washington.html>

⁶⁸ <https://www.nwcouncil.org/ext/maps/APPrograms/>

⁶⁹ <https://www.dnr.wa.gov/natural-heritage-program>

⁷⁰ <https://www.dnr.wa.gov/managed-lands/natural-areas/natural-area-preserves>

⁷¹ <https://www.dnr.wa.gov/managed-lands/natural-areas/natural-resources-conservation-areas>

⁷² http://wdfw.wa.gov/lands/wildlife_areas/

⁷³ WAC 365-190-130(1)

Tools local government have at their disposal to protect fish and wildlife habitat conservation areas include regulatory tools (e.g., conditioning permits via Critical Area Ordinances, maintaining low density zoning in biologically diverse areas) and non-regulatory tools (e.g., voluntary restoration, acquisition, or educational programs). To aid local governments in their efforts to protect fish and wildlife habitat conservation areas, WDFW's Priority Habitats and Species (PHS) program⁷⁴ offers science-based PHS Management Recommendations and technical assistance through WDFW's regional habitat biologists. PHS Management Recommendations identify actions local governments, landowners, and developers can take to maintain ecosystem functions within areas closely associated with Priority Species (e.g., seasonal ranges, breeding habitat, winter range, and movement corridors) as well as within Priority Habitats (e.g., areas with high relative population density or species richness).

Perhaps the most common fish and wildlife habitat conservation areas found throughout the state are riparian ecosystems. Riparian areas have direct effects on anadromous fisheries as well as 85 percent of Washington's terrestrial vertebrate species. WDFW will issue its updated Riparian Management Guidance for achieving no net loss of riparian ecosystem functions soon.⁷⁵

Local governments that permit activities in the uplands that may affect saltwater areas (e.g., clearing and grading) should consider protecting aquatic resources by imposing work window constraints consistent with those imposed by WDFW for Hydraulic Permit Applications.⁷⁶

Special Consideration for Anadromous Fisheries

Maintaining riparian ecosystem connectivity and the quality and quantity of riparian vegetation are key to functioning salmonid habitat. Counties and cities may use information prepared by the U.S. Fish and Wildlife Service, NOAA Fisheries, the WDFW, the State Recreation and Conservation Office (RCO), and the Puget Sound Partnership to designate, protect, and restore salmonid habitat.⁷⁷ Counties and cities should consider recommendations found in salmon recovery plans. The [Governor's Salmon Recovery Office and RCO](#) website provides links to the recovery plans, monitoring efforts, policies, and the lead entities that coordinate salmon recovery locally.⁷⁸

WDFW's [Land Use Planning for Salmon, Steelhead and Trout](#)⁷⁹ provides guidance for counties and cities to protect and restore salmonid habitat. It is designed to assist the integration of local land use planning programs and state salmon recovery efforts. This planner's guide to salmonid recovery is intended for local governments and includes information on state salmon recovery efforts, sources of best available science, and model policies and development regulations for implementing salmon recovery.

⁷⁴ <https://wdfw.wa.gov/conservation/phs/>

⁷⁵ PLACEHOLDER FOR LINK TO RIPARIAN GUIDANCE

⁷⁶ [WAC 220-660-330](#). WDFW applies timing windows to reduce the risk of impacts to fish life at sensitive life stages.

⁷⁷ WAC 365-190-130(4)(i)

⁷⁸ https://www.rco.wa.gov/salmon_recovery/gsro.shtml

⁷⁹ <https://wdfw.wa.gov/publications/00033/>

Growth Management Hearings Board Decisions

Pierce County was challenged before the Central Puget Sound Growth Management Hearings Board for removing the marine shorelines from critical areas. Pursuant to RCW 36.70A.480, the Board agreed with Pierce County that marine shorelines are not per se fish and wildlife habitat conservation areas [critical areas]. The Board then asked (1) whether Pierce County used best available science to protect critical fish and wildlife habitat conservation areas on its marine shorelines; (2) whether Pierce County's regulations gave priority to anadromous fish; (3) whether Pierce County's regulations protect the functions and values of marine shorelines as salmon habitat, and (4) whether a vegetative buffer is required.

The County's critical areas ordinance identified a number of critical fish and wildlife conservation areas on its marine shorelines. These include eelgrass beds, shellfish beds, surf smelt spawning areas and the like. However, the critical areas ordinance was drafted to designate and protect all Pierce County marine shorelines. When the County Council voted to remove the marine shorelines from critical areas, it did so (a) without ascertaining whether the remaining protected salt-water areas included all the areas important for protection and enhancement of anadromous fisheries and (b) without assessing whether the overlay of elements remaining in the critical areas ordinance [i.e. steep slopes, erosion areas, eelgrass beds, etc.] would protect the "values and functions" necessary for salmon habitat. The Board concluded that Pierce County failed to comply with RCW 36.70A.172(1) in failing to use best available science to designate and protect fish and wildlife habitat conservation areas, in failing to "protect the functions and values" of marine shorelines as critical salmon habitat, and in failing to "give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries."⁸⁰

The Eastern Washington Growth Management Hearings Board found that the nomination process for habitats and species of local importance is necessary for listing those habitats and species which become candidates in the future, not as the sole process to protect those already in danger. It is not the responsibility of the WDFW or any other state agency, as was suggested by Ferry County, to petition the County to adopt a habitat, species or both. The GMA specifically requires the County to protect fish and wildlife conservation areas, thus endangered, threatened and sensitive species and habitats and species of local importance.⁸¹

Polygon and point data are based on actual field surveys and observations of the species ... WDFW claimed if a habitat is mapped, then a species inhabits or has been known to inhabit that area ... The Board has held that failing to protect both point and polygon data violates the GMA. As to point and polygon validations in Section 9.04, the Board found that section was out of compliance with RCW's 36.70A.060 and 36.70A.172 for failure to protect endangered, threatened and sensitive species by requiring WDFW, a state agency without authority to enforce local critical areas ordinance provisions (or any Ferry County code provisions, even if they relate to fish and wildlife), to validate point observations and polygon observations, which would only then trigger protection measures.⁸²

⁸⁰ *Tahoma Audubon Society, et al v. Pierce County*, 05-3-0004c, FDO, July 12, 2005, at 37.

⁸¹ *CDFC/Robinson v. Ferry County*, 97-1-0018, Compliance Order (Feb. 13, 2009), at 15.

⁸² *Id.*, at 18.

In designating fish and wildlife habitat conservation areas, the Board stated the County must at least designate “areas with which endangered, threatened, or sensitive species have a primary association and the designation” must be based on best available science as required by 36.70A.172. The Eastern Board found that Stevens County had done an admirable job of requiring pre-set buffers or alternative buffers set on a case by case basis, and requiring a report from a qualified professional to set management recommendations, if a development is within “a mapped critical habitat area” for endangered, threatened or sensitive species. But the County was found to fall short by defining “critical habitat” as “only those areas designated by a state or federal agency through a formal statutory or rule-making process.”⁸³

The Eastern Board held that, to protect endangered, threatened, or sensitive species and their habitat, such as the lynx, which knows no country, state or county boundary, there must be intergovernmental cooperation and coordination, as stated in [WAC 365-190-130(1)]⁸⁴. If Stevens County did not designate fish and wildlife conservation areas for certain listed species using best available science and all the information available from WDFW, but neighboring counties, such as Ferry County and Pend Oreille County did, then there would be a disconnect in protection for the listed species and extinction a real possibility. Simply put, the federal government can designate critical habitat for endangered, threatened or sensitive species, but under a separate rule-making process and, for the most part, only for federal lands. Therefore, the Board found that a U.S. Fish and Wildlife Service rule-making does not have an effect on most state or Stevens County lands.

The Eastern Board noted that the state does not have the legislative authority to designate critical habitat for endangered, threatened or sensitive species through a rule-making process, and the federal government’s rule-making for endangered, threatened or sensitive species habitat is separate from its listed species. Since critical areas are designated by counties and cities under the Growth Management Act, they are responsible to protect the endangered, threatened or sensitive species habitat.

In addressing bull trout critical habitat in Ferry County, the Eastern Washington Growth Management Hearings Board stated: “[T]he absence of federally-designated critical habitat is not a determinative fact for purposes of a county’s GMA designation of areas where endangered, threatened or sensitive species have a “primary association.”⁸⁵

WAC 365-190-130(2) directs jurisdictions to consider and designate areas where endangered, threatened, and sensitive species have a primary association. The Western Washington Growth Management Hearings Board found that Island County’s prairies have such an association with the three referenced [ETS] plant species.⁸⁶ Citing WAC 365-190-130(2)(b)’s direction to consider habitats and species of local importance for classification and designation, the Board found the County had failed to protect critical areas by its decision to not designate Westside prairies, Oak woodlands and herbaceous

⁸³ *Futurewise v. Stevens County*, 05-1-0006, FDO, Jan. 13, 2006.

⁸⁴ Formerly WAC 365-190-080(5)

⁸⁵ *Concerned Friends of Ferry County v. Ferry County*, 97-1-0018c Order Finding Continuing Noncompliance, January 23, 2013, p. 11.

⁸⁶ *Whidbey Environmental Action Network v. Island County*, 14-2-0009, Final Decision and Order, June 26, 2015, p. 34.

balds as habitats of local importance notwithstanding, the record established these areas constitute rare or vulnerable ecological systems and habitat or habitat elements.⁸⁷

The Eastern Washington Growth Management Hearings Board held that a County is required to make a “reasoned analysis on the record, including best available science and other local factors” in determining whether or not a habitat or species should be designated as Habitat or Species of Local Importance. The Growth Management Act requires the record to include best available science in developing policies and development regulations to protect the functions and values of critical areas, which Habitats and Species of Local Importance are an important part. RCW 36.70A.172(1).

Case law has made it perfectly clear that legislative bodies, such as counties and cities, must substantially consider best available science to support their findings concerning the nominations of Habitat of Local Importance and/or Species of Local Importance. In addition, a local jurisdiction is not constrained to adopt only the science recognized by state or federal agencies, but a variation from formally identified BAS must be supported in the record by evidence that also meets the BAS standard (see WAC 365-195-905). Local governments must “analyze the scientific evidence and other factors in a reasoned process.” Legislative bodies must also be cautious about using their own science just to support their own agenda....⁸⁸

The Western Washington Growth Management Hearings Board found that a county has wide discretion in determining which plant species and/or habitats have sufficient local importance to warrant designation and protection as species of local importance.⁸⁹ [T]he decision on whether or not to designate species or habitats of local importance lies with the County in accordance with WAC 365-190-130.⁹⁰ However, the Board also stated that it is unaware of any requirement in the GMA which mandates the establishment of a process for designating new habitats of local importance.⁹¹

⁸⁷: Id, at p. 37.

⁸⁸ *Loon Lake Property Owners Assoc., et al. v. Stevens County*, 03-1-0006c, 3rd Order on Compliance, (Dec. 21, 2005).

⁸⁹ *ICCGMC v. Island County*, 98-2-0023c, Compliance Order, 11-26-01.

⁹⁰ *Friends of the San Juans, et al. v. San Juan County*, 13-2-0012c: FDO (September 6, 2013), at 39.

⁹¹ Id, at 42.

Designating and Protecting Frequently Flooded Areas

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 (NFIP).⁹²

Restricting floodplain development can minimize adverse effects to human health and infrastructure. 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, including the provisions for urban growth areas in RCW 36.70A.110;
- 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;
- The potential effects of tsunami, high tides with strong winds, sea level rise, and extreme weather events, including those potentially resulting from global climate change; and
- Greater surface runoff caused by increasing impervious surfaces.⁹³

Sources and Methods for Designation and Protection

In reviewing critical areas regulations for floodplains, each local government must consider the adequacy of the designation and protection of frequently flooded areas. In these reviews, new information such as maps or relevant science findings needs to be integrated. Ecology provides [Critical Areas Ordinance Guidance for Frequently Flooded Areas](#).⁹⁴

FEMA maps, called Flood Insurance Rate Maps (FIRM) and 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, flood risk assessments in local hazard mitigation plans, 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.⁹⁵ 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.

⁹² WAC 365-190-110(1)

⁹³ WAC 365-190-110(2)

⁹⁴ <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Guidance-for-floodplains-Critical-Areas-Ordinanc>

⁹⁵ 44 CFR 60.3 and Chapter 86.16 RCW

Official FIRMs are found at the [FEMA Map Service Center](#).⁹⁶ Since 2015, FEMA Flood Insurance Rate Maps (FIRMs) that have been adopted for coastal areas have included a degree of consideration for high tides and wind events. However, no FIRMs presently consider sea level rise.

Ecology offers coastal data at the [Washington State Coastal Atlas](#) web site.⁹⁷ Additional resources related to tsunami inundation and evacuation can be found at the [WDNR Geology Portal](#).⁹⁸ For sea level rise, there is useful information on the [Washington Climate Impacts Group](#) site.⁹⁹

Washington communities can also get credit through the Community Rating System (CRS) program for floodplain designation, planning, and protective regulations. The CRS program can reduce the flood insurance rates for all NFIP policyholders in the jurisdiction. To learn more about CRS, and learn if your community participates, please contact your local floodplain administrator or the Department of Ecology.¹⁰⁰

Floodplains by Design

Floodplains by Design (FbD) is a partnership of state and private organizations focused on coordinating investment in and strengthening the integrated management of floodplain areas to simultaneously support flood risk reduction, ecological restoration, agriculture and recreational opportunities. The Department of Ecology administers the Floodplains by Design grant program. Ecology issues a request for Floodplains by Design project proposals approximately 18 months prior to the start of each state budget biennium. There is a subsequent application process. After review by Ecology, a ranked project funding list is presented for inclusion in the Governor's proposed capital budget for the next biennium.¹⁰¹

Special Consideration for Anadromous Fisheries

Historic losses to salmon habitat have occurred as a result of development encroaching into floodplains. 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.

Increasingly, there is recognition of the importance of floodplains as vital habitat to support salmon and other species. Relevant information may be found in updates to salmon recovery plans, channel migration zone mapping or other sources. These sources should be considered in development of revised Critical Areas Ordinances provisions which better protect riparian habitat. These protections

⁹⁶ <https://msc.fema.gov/portal>

⁹⁷ <https://fortress.wa.gov/ecy/coastalatlas/>

⁹⁸ <https://www.dnr.wa.gov/geologyportal>

⁹⁹ <https://cig.uw.edu/resources/>

¹⁰⁰ To learn more about the CRS program, please visit crsresources.org.

¹⁰¹ More information about Floodplains by Design is at <http://www.ecy.wa.gov/programs/sea/floods/index.html>.

may be addressed under the [Frequently Flooded Area] provisions or within the Fish and Wildlife Habitat Conservation Area provisions of a Critical Areas Ordinances.

For more information on protecting frequently flooded areas for salmon, see the WDFW's [*Land Use Planning for Salmon, Steelhead and Trout: A land use planner's guide to salmonid habitat protection and recovery*](#).¹⁰²

FEMA Guidance on National Marine Fisheries Service Puget Sound Biological Opinion

The National Marine Fisheries Service (NMFS) issued a [Biological Opinion](#) (BiOp) under the Endangered Species Act (ESA) on the National Flood Insurance Program (NFIP) in Puget Sound.¹⁰³ The BiOp was provided following consultation with FEMA regarding effects of NFIP on listed species within the Puget Sound Region – Chinook Salmon, Puget Sound steelhead, Hood Canal summer-run chum salmon, and Southern Resident killer whales. FEMA has the ultimate authority for determining the adequacy of BiOp compliance. FEMA has provided three options for local government compliance with the ESA:

- **Door #1: Model Ordinance approach** – This approach combines standard NFIP floodplain requirements with Biological Opinion habitat protection requirements. FEMA guidance on Floodplain Management and the Endangered Species Act: A Model Ordinance (November 2013) for developing a Door 1 program is posted on FEMA's [web site](#). Door 1 model ordinances must be approved by FEMA.¹⁰⁴
- **Door #2: Community Checklist/Programmatic approach** – This approach uses existing state requirements, such as GMA, SMA, drainage, and grading requirements adopted at the local level to provide flexibility, while meeting the minimum requirements for salmon in the BiOp. A critical areas ordinance that addresses the habitat concerns identified in the BiOp can support a Door 2 programmatic response. A community that uses Door 2 can implement the Puget Sound Biological Opinion compliance through its own codes and procedures. A Checklist for Programmatic Compliance (November 2013) is also on the [FEMA web site](#).¹⁰⁵ Door 2 programs must be approved by FEMA.
- **Door #3: Permit by permit demonstration of compliance/Individual approach** - In 2013, FEMA provided updated guidance on how to prepare a habitat assessment, [Floodplain Habitat Assessment and Mitigation: Regional Guidance for the Puget Sound Basin](#).¹⁰⁶ Implementing the FEMA guidance will assist local governments in addressing compliance with the Endangered Species Act Biological Opinion (BiOp). The Critical Areas Ordinances update provides an

¹⁰² <https://wdfw.wa.gov/publications/00033/>

¹⁰³ https://www.fema.gov/media-library-data/20130726-1900-25045-9907/nfip_biological_opinion_puget_sound.pdf

¹⁰⁴ https://www.fema.gov/media-library-data/1383597893424-4747f702310a2bbc7e04ea83d66f73f5/NFIP_ESA_Model_Ordinance.pdf

¹⁰⁵ https://www.fema.gov/media-library-data/1383597499829-c4d2a589c8ae1463357c1cac8d043ce7/NFIP_ESA_Biological_Opinion_Checklist.pdf

¹⁰⁶ https://www.fema.gov/media-library-data/1383598118060-e34756afe271d52a0498b3a00105c87b/Puget_Sound_R10_Habitat_Assess_guide.pdf

opportunity for local governments to include or reference procedures for BiOp implementation in their Floodplain Management Regulations or combined Floodplain Management Regulations/Critical Areas Ordinances. This will help ensure that all staff and other parties are aware of these procedures required to comply with the BiOp.

Communities that are considering adopting a Door #1 ordinance or a Door #2 program should contact FEMA and the Department of Ecology. FEMA Region 10 contacts are posted [here](#).¹⁰⁷ Department of Ecology contacts can be found [here](#) by typing “floodplain management” in the directory.¹⁰⁸

Growth Management Hearings Board Decisions

The Western Washington Growth Management Hearings Board views the GMA as effectively establishing two categories of critical areas – those areas whose functions and values are protected for the beneficial services they provide (i.e. Wetlands, FWHCAs, Aquifer Recharge Areas) and those areas for which protection is needed due to the threat these areas pose to persons and property (i.e. Frequently Flooded Areas, Geologically Hazardous Areas).¹⁰⁹

The Western Board found the issue of allowing new residential construction in frequently flooded areas is a question of protection of critical areas. Pursuant to WAC 365-195-[830(3)], “protection” of critical areas also means “to safeguard the public from hazards to health and safety.” Whether to allow new residential construction in a frequently flooded area is a matter of hazards to public health and safety. Therefore, the adoption of regulations allowing such residential construction must include best available science.¹¹⁰

¹⁰⁷ <https://www.fema.gov/region-x-contact-information-ak-id-or-wa>

¹⁰⁸ <https://fortress.wa.gov/ecy/staffsubjectsearch/interExpertiseLookupFrame.html>

¹⁰⁹ *OSF/CPCA v. Jefferson County*, 08-2-0029c, FDO, Nov. 19, 2008, p. 27. See FDO at 31-39 for general discussion on channel migration zones, including designation, risk assessment, and development standards.

¹¹⁰ *ADR/Diehl v. Mason County*, 07-2-0010, FDO, January 16, 2008, p. 19.

Designating and Protecting Geologically Hazardous Areas

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.¹¹¹

Some geological hazards can be reduced or mitigated by engineering, design, or modified construction or mining practices so that risks to public health and safety are minimized. When technology cannot reduce risks to acceptable levels, building in geologically hazardous areas must be avoided. The distinction between avoidance and compensatory mitigation should be considered by counties and cities that do not currently classify geological hazards, as they develop their classification scheme.¹¹²

The Minimum Guidelines as updated in 2010 define geologically hazardous areas that should be designated as critical areas as follows:

- "Geologically hazardous areas" are areas that because of their susceptibility to erosion, sliding, earthquake, or other geological events, are not suited to siting commercial, residential, or industrial development consistent with public health or safety concerns.¹¹³
- "Erosion hazard areas" are those areas containing soils which, according to the United States Department of Agriculture Natural Resources Conservation Service (NRCS) Soil Survey Program, may experience significant erosion. Erosion hazard areas also include coastal erosion-prone areas and channel migration zones.¹¹⁴ Erosion hazard areas include areas likely to become unstable, such as bluffs, steep slopes, and areas with unconsolidated soils. Erosion hazard areas may also include coastal erosion areas. This information can be found in the [Washington State Coastal Atlas](https://fortress.wa.gov/ecy/coastalatlus/) available from the Department of Ecology.¹¹⁵ Counties and cities may consult with the NRCS for data to help identify erosion hazard areas.¹¹⁶
- "Landslide hazard areas" are areas at risk of mass movement due to a combination of geologic, topographic, and hydrologic factors.¹¹⁷ They include any areas susceptible to landslide because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors (listed in the WAC).¹¹⁸
- "Seismic hazard areas" are areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement or subsidence, soil liquefaction, surface faulting, debris flows, lahars, or tsunamis.¹¹⁹ Settlement and soil liquefaction conditions occur in areas underlain by cohesionless soils of low density, typically in association with a shallow

¹¹¹ WAC 365-190-120(1)

¹¹² WAC 365-190-120(2)

¹¹³ WAC 365-190-030(9)

¹¹⁴ WAC 365-190-030(5)

¹¹⁵ <https://fortress.wa.gov/ecy/coastalatlus/>

¹¹⁶ WAC 365-190-120(5)

¹¹⁷ WAC 365-190-030(10)

¹¹⁸ WAC 365-190-120(6)

¹¹⁹ WAC 365-190-030(18) and 190-120(7)

groundwater table. One indicator of potential for future earthquake damage is a record of earthquake damage in the past. Ground shaking is the primary cause of earthquake damage in Washington, and ground settlement may occur with shaking.¹²⁰

- "Volcanic hazard areas" must include areas subject to pyroclastic flows, lava flows, debris avalanche, or inundation by debris flows, lahars, mudflows, or related flooding resulting from volcanic activity.¹²¹
- "Mine hazard areas" are those areas underlain by, adjacent to, or affected by mine workings such as adits, gangways, tunnels, drifts, or air shafts. Factors which should be considered include: proximity to development, depth from ground surface to the mine working, and geologic material.¹²²

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.

Sources for Designation

The Washington State Department of Natural Resources' [Geologic Hazards and the Environment web site](#) provides information on earthquakes and faults, landslides, volcanoes and lahars, tsunamis, and geologic hazard maps.¹²³ The Department also maintains a [Geologic Information Portal](#) that contains interactive earth science mapping, data, and related information on several topics. The Portal provides a user guide in written and video formats.¹²⁴

Special Consideration for Anadromous Fisheries

Geologically hazardous areas may affect salmonids in a variety of ways. Steep slopes along shorelines can include feeder bluffs that benefit salmon habitat. However, erosion and mass wasting slide events can block streams or overload them with sediment in the short term. Seismic events can cause built objects to fall into streams, including pollutants such as chemicals and spilled fuels.

WDFW recommends local government give special protection to landslide hazard areas that can damage rivers and streams during mass wasting events. Riparian buffers help retain vegetation and control

¹²⁰ WAC 365-190-120(7)

¹²¹ WAC 365-190-030(21) and 190-120(8)(a)

¹²² WAC 365-190-120(8)(b)

¹²³ <https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards-and-environment>

¹²⁴ <https://www.dnr.wa.gov/geologyportal>

drainage on steep slopes. Protecting marine bluffs allows natural functions of beach nourishment and avoids elevated levels of suspended sediments and turbidity.¹²⁵

Growth Management Hearings Board Decisions

The Western Washington Growth Management Hearings Board concluded that Jefferson County's designation of channel migration zones as geologically hazardous areas was based, in part, on an analysis of historical data in combination with present day scientific methodologies. The future potential or susceptibility of damage creates the risk for which critical area designation as a geologically hazardous area was needed.¹²⁶

The Western Board disagreed with Petitioner's contention that the functions and values of a channel migration zone do not presently exist and therefore the GMA does not authorize the designation. To support this statement would be contrary to the very functions and values underlying a [geologically hazardous area] - to protect against future loss of life and/or property due to the geological event being addressed. In other words, the functions and values sought to be protected by [geologically hazardous areas] are the protection of life and property and those functions and values exist today.¹²⁷

The Central Puget Sound Growth Management Hearings Board found there is no GMA directive that prohibits development in a lahar or liquefaction zone because of geological risks. While hazard areas are defined as areas that are not suited to development consistent with public health and safety, the GMA definition by itself did not impose an independent duty upon Pierce County to protect life and property by prohibiting development.... The Board noted in the case of flood risks, the Legislature has defined the 100-year floodplain as mapped by FEMA as setting the bounds for more intensive development. The Board found no such bounds have been legislated into the GMA for other geological hazards.¹²⁸

The Central Board found that the City of Seattle had designated areas at risk of more remote geologic hazards, as set forth in the Board's FDO in accordance with Commerce's guidelines. The City adopted various state and federal maps to designate these geologically hazardous areas, and enacted a procedure, including public participation, allowing for the update of these maps by Director's rule. The Board found these actions in compliance with the Act.¹²⁹

The Central Board found it a jurisdiction's duty and obligation to protect the public from potential injury or damage that may occur if development is permitted in geologically hazardous areas is not rooted in challenged GMA critical area provisions. Rather, providing for the life safety of occupants and the

¹²⁵ WDFW [Land Use Planning for Salmon, Steelhead and Trout](https://wdfw.wa.gov/publications/pub.php?id=00033), page 75. (<https://wdfw.wa.gov/publications/pub.php?id=00033>)

¹²⁶ *OSF/CPCA v. Jefferson County*, 08-2-0029c, FDO, Nov. 19, 2008, p. 28. [Note: The Board's decision was appealed to the Court of Appeals on different issues than discussed here. The Court upheld the Board's decision in *Olympic Stewardship Found. v. Western Washington Growth Management Hearings Board*, 166 Wn. App. 172 (2012), review denied, 174 Wn.2d 1007 (2012).]

¹²⁷ Id., at 29. See the FDO at pp. 31-39 for a general discussion on channel migration zones as a type of geologically hazardous area, including designation, risk assessment, and development standards.

¹²⁸ *Friends of Pierce County, et al. v. Pierce County*, 12-3-0002c, FDO July 9, 2012, pg. 98, 103.

¹²⁹ *Seattle Audubon Society, et al v. City of Seattle*, 06-3-0024, Order Finding Compliance, May 29, 2007, p. 4.

control of damage to structures and buildings is within the province of building codes, Chapter 19.27 RCW.¹³⁰

The Central Board went on to say that there is no disagreement that construction of buildings and structures near a seismic hazard area is governed by the 2003 International Building Code, as adopted by the State Building Code, and applicable to Snohomish County. However, the County had identified a “regulatory gap” which is characterized as follows: The IBC’s seismic provisions only apply to faults that have been verified and mapped by the USGS. The newly discovered faults and inferred faults have not yet been mapped by USGS. Therefore, the IBC provisions were not directly applicable. Consequently, to protect the public and property, the County had taken the action of adopting the Seismic Ordinance to fill this gap. Petitioners didn’t dispute the gap, but rather contended that the regulations did not go far enough. The Board concluded that the County’s adoption of the Seismic regulations was a responsible and reasonable action in face of the regulatory gap identified.¹³¹

The Board found and concluded that there is no discrepancy between Snohomish County’s definition of “seismic hazard areas” and the GMA’s definition of “geologically hazardous areas.” While the GMA definition imposes no independent duty upon the County to protect life safety, the Board noted that the County’s definition falls within the broader GMA definition and is more protective than that included in the IBC, since it includes protections for “inferred fault” areas.¹³²

¹³⁰ *Sno-King Environmental Alliance, et al v. Snohomish County*, 06-3-0005, FDO, July 24, 2006, p. 15.

¹³¹ *Id.*, at 15-16.

¹³² *Id.*, at 16.

Designating and Protecting Critical Aquifer Recharge Areas

Potable water is an essential life sustaining element for humans and many other species. Much of Washington's drinking water comes from groundwater sources. Once groundwater 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 and ecosystems.¹³³

The Minimum Guidelines define "critical aquifer recharge areas" as those with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge.¹³⁴

The quality and quantity of groundwater in an aquifer is inextricably linked to its recharge area. Where aquifers and their recharge areas have been studied, affected counties and cities should use this information as the basis for classifying and designating these areas. Where no specific studies have been done, counties and cities may use existing soil and surficial geologic information to determine where recharge areas exist. Wellhead protection areas defined by drinking water purveyors can provide information about recharge area. The Department of Health maintains a map of these areas.¹³⁵ To determine the threat to groundwater quality, existing land use activities and their potential to lead to contamination should be evaluated.¹³⁶

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.

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.

Counties and cities must classify recharge areas for aquifers according to the aquifer vulnerability. Vulnerability is the combined effect of hydrogeological susceptibility to contamination and the

¹³³ WAC 365-190-100(1)

¹³⁴ WAC 365-190-030(3)

¹³⁵ <https://fortress.wa.gov/doh/eh/dw/swap/maps/>.

¹³⁶ WAC 365-190-100(2)

contamination loading potential. High vulnerability is indicated by land uses that contribute directly or indirectly to contamination that may degrade groundwater, and hydrogeologic conditions that facilitate degradation. Low vulnerability is indicated by land uses that do not contribute contaminants that will degrade groundwater, and by hydrogeologic conditions that do not facilitate degradation. Hydrological conditions may include those induced by limited recharge of an aquifer. Reduced aquifer recharge from effective impervious surfaces may result in higher concentrations of contaminants than would otherwise occur.¹³⁷

Important Considerations for Designating Critical Aquifer Recharge Areas

Characterize Hydrogeologic Susceptibility

The following parameters are found by using techniques hydrogeologists use. Depth to ground water is a 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.

To characterize hydrogeologic susceptibility of the recharge area to contamination, counties and cities may consider the following physical characteristics:

- Depth to groundwater;
- Aquifer properties such as hydraulic conductivity, gradients, and size;
- Soil (texture, permeability, and contaminant attenuation properties);
- Characteristics of the vadose zone including permeability and attenuation properties; and
- Other relevant factors.¹³⁸

Evaluate Potential Contaminant Loading Risk Factors

The following may be considered to evaluate vulnerability based on the contaminant loading potential:

- General land use;
- Waste disposal sites;
- Agriculture activities;
- Water quality test results;
- Proximity to marine shorelines; and
- Other information about the potential for contamination.

¹³⁷ WAC 365-190-100(3)

¹³⁸ WAC 365-190-100(3)(a)

Classification Strategy

A classification strategy for aquifer recharge areas should be to maintain the quality, and if needed, the quantity of the groundwater, with particular attention to recharge areas of high susceptibility. In recharge areas that are highly vulnerable, studies should be initiated to determine if groundwater contamination has occurred. Classification of these areas should include consideration of the degree to which the aquifer is used as a potable water source, feasibility of protective measures to preclude further degradation, availability of treatment measures to maintain potability, and availability of alternative potable water sources.¹³⁹

Examples of areas with a critical recharging effect on aquifers used for potable water may include:

- Recharge areas for sole source aquifers designated pursuant to the Federal Safe Drinking Water Act;
- Areas established for special protection pursuant to a groundwater management program, chapters [90.44](#), 90.48, and [90.54](#) RCW, and chapters [173-100](#) and [173-200](#) WAC;
- Areas designated for wellhead protection pursuant to the Federal Safe Drinking Water Act;
- Areas near marine waters where aquifers may be subject to saltwater intrusion; and
- Other areas meeting the definition of "areas with a critical recharging effect on aquifers used for potable water" in these guidelines.¹⁴⁰ Even if an area is not designated in the above list (sole source aquifer, well head protection area, etc.), the physical characteristics such as depth to water or permeability should be used to designate critical aquifer recharge areas.

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; and
- Well head protection/Source water protection.

¹³⁹ WAC 365-190-100(4)(a)

¹⁴⁰ WAC 365-190-100(4)(b)

In some cases, local water purveyors have already performed significant portions of the foundational work necessary to enable a local government to designate and direct aquifer recharge protection¹⁴¹. A local government needn't "reinvent the wheel" in performing its critical aquifer recharge area analysis. It can utilize studies, maps, and other information provided by the water purveyor. In all cases, water purveyors have data about the aquifers they utilize for their supplies, which can assist in the delineation of specific critical aquifer recharge areas and their susceptibility. At the same time, local governments should regard this as valuable resource information only, keeping in mind that relevant case law (see below) contradicts merely adopting a protective area identified by a water purveyor without a more encompassing analysis.

This information-sharing is often easier with a municipally owned water system, as staff-to-staff consultation can occur internally. With a separately operated system such as a special purpose district, the jurisdiction should engage the purveyor in stakeholder communications when looking at critical aquifer recharge area regulations. This is intended to be a back-and-forth communication. As part of their water system planning responsibilities, public water purveyors must:

- Ask each local government with jurisdiction over the service area (recognizing that it may overlap) to provide a consistency review on its water system plan. This takes the form of 60-day notice similar to GMA updates/amendments. If the local government requests it, an additional 30 days' review time can be provided.
- Include a consistency review with supporting documentation describing how it has considered consistency with local plans and regulations.¹⁴²

Growth Management Hearings Board Decisions Regarding Designation

WAC 365-190-040(5)(b) states that in circumstances where critical areas cannot be readily identified, these areas should be designated by performance standards or definitions. WAC 365-190-040(5)(c) provides that designation could be satisfied by the adoption of a policy statement. The Eastern Washington Growth Management Hearings Board found that critical aquifer recharge areas expressly fall within this realm because, unlike wetlands or streams which can be visually delineated, the underground nature of an aquifer provides for a more challenging determination as to their location and boundaries.¹⁴³

The Eastern Board found that Walla Walla County relied exclusively upon pre-existing "Wellhead Protection Areas" as satisfying the GMA requirement to designate Critical Aquifer Recharge Areas. The Board found that this approach is not supported by the science. The scientific information did not indicate that using wellhead protection areas alone is sufficient to protect the large gravel aquifer. Individual wellhead protection areas may protect some wells that constitute regulated public water

¹⁴¹ See, generally, Chapter 246-290 WAC for water system planning requirements, including wellhead protection plans. Source documentation is set forth in WAC 246-290-130, source protection is addressed in WAC 246-290-135, and watershed control is included in WAC 246-290-668. Source control areas, watershed control programs, and wellhead times of travel are particularly related to emplacing meaningful land-use regulations that protect source water, particularly constraints on certain uses that could pollute.

¹⁴² WAC 246-290-108

¹⁴³ *Hazen, et al v. Yakima County*, 08-1-0008c (April 5, 2010), FDO at 22-23..

systems, but there was no evidence in the record that this approach protects the large number of unregulated individual or exempt wells, nor was there any evidence that this approach is sufficient to protect the larger gravel aquifer which underlies a land area of about 190 square miles.¹⁴⁴

The WAC 365-190-[100(2)] guidelines state that to determine the location of aquifer recharge areas, counties may use existing studies or may use existing soil and surficial geologic information. The Eastern Board found the record did not show that Walla Walla County made any such determinations as to the Gravel Aquifer recharge areas. In the absence of basic locational information on specific recharge areas, the County could not effectively determine which areas are “critical” to preventing adverse impacts to the aquifer. Moreover, the record didn’t show a consideration of the WAC guidelines which prescribe (1) an evaluation of the threat of ground water contamination from existing land use activities¹⁴⁵, and (2) the designation of aquifer specific recharge areas based upon vulnerability of the aquifer to contamination.¹⁴⁶

[T]he GMA does not necessarily require designation of the entire 190 square mile aquifer. Rather, the GMA requires designation and protection of “areas with a critical recharging effect on aquifers used for potable water.” The Board concluded that the extent of these designated critical recharge areas, as distinct from the underlying aquifer itself, is determined through a substantive consideration of Best Available Science, which has not yet occurred in Walla Walla County.¹⁴⁷

WAC 365-190-080(4) states that counties and cities should designate critical areas by using maps and performance standards, and counties and cities should clearly state that maps showing known critical areas are only for information or illustrative purposes ... The Eastern Board found that, during its compliance efforts, Yakima County’s CARA map, which was based on older, superseded science, was not reviewed or revised to reflect updated best available science, thus ... Without a mapping update to include Best Available Science, the pre-existing CARA designation map did not comply with the GMA.¹⁴⁸

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.

¹⁴⁴ *Citizens for Good Governance v. Walla Walla County*, 09-1-0013 (May 3, 2010) Final Decision and Order at 6-7.

¹⁴⁵ WAC 365-190-100(2)

¹⁴⁶ *Citizens for Good Governance v. Walla Walla County*, 09-1-0013 (May 3, 2010) Final Decision and Order at 7-8, quoting WAC 365-190-100(3).

¹⁴⁷ *Id.*, at 10.

¹⁴⁸ *Hazen, et al. v. Yakima County*, Coordinated Cases 08-1-0008c and 09-1-0014, Coordinated Compliance Order/Issuance of Stay (April 27, 2011) at 10.

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.¹⁴⁹ 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 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 regulations 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.

¹⁴⁹ See Freeze, S.F. and J.A. Cherry, *Groundwater*, Prentice Hall, Inc. 1979.

- 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.

Wellhead protection areas are a type of critical aquifer recharge area¹⁵⁰ for which separate guidance exists. In addition, Ecology has produced its own guidance specific to critical aquifer recharge areas.¹⁵¹

Growth Management Hearings Board Decisions

The Western Washington Growth Management Hearings Board was not persuaded by Jefferson County's argument that it has no authority to impose some form of water conservation measures, limiting the number of new wells allowed, or other measures to reduce the withdrawal of groundwater from individual wells if that withdrawal would disrupt the seawater/freshwater balance and lead to greater seawater intrusion. The exemption of RCW 90.44.050 does not limit a local jurisdiction from complying with its mandate for protection of groundwater quality and quantity under the GMA.¹⁵²

In a subsequent Jefferson County decision¹⁵³, the Western Board found that a county which has considered the best available science and adopted less stringent protection standards that balance the need for protection of potable water supplies against the chilling effect of regulation against development has complied with the GMA only if the county also adopts a monitoring strategy that includes stricter development regulations that will be implemented at once if the less stringent protection standards prove to be inadequate to protect against seawater intrusion. The Board also found:

- Both the Growth Management Act and Jefferson County's own comprehensive plan require a county to protect not only those places where freshwater enters the ground, but also the aquifers that they feed. The Board held the County must classify and designate seawater intrusion areas as critical areas, including best available science in a substantive way.
- Although the County claimed that the data in the record were not adequate to designate vulnerable seawater intrusion areas, that did not nullify the County's obligation to take action to designate and protect CARAs including aquifers used for potable water.
- A county's decision to use a different approach than previously adopted does not necessarily make that choice non-GMA compliant. However, the new approach must comply with the Act. The county's approach of failing to designate any vulnerable seawater intrusion areas as critical areas does not comply with the Act.

¹⁵⁰ <https://www.doh.wa.gov/Portals/1/Documents/Pubs/331-018.pdf>. Health expects to begin updating this document soon.

¹⁵¹ <https://fortress.wa.gov/ecy/publications/documents/0510028.pdf>. Ecology expects to begin updating this document soon.

¹⁵² *Olympic Environmental Council v. Jefferson County*, 01-2-0015 (FDO, 1-10-02).

¹⁵³ *Olympic Environmental Council, et al. v. Jefferson County*, 01-2-0015 (Compliance Order, 12-4-02).

- It makes great sense for the intergovernmental planning group to study water issues on a watershed basis. However, that group has no authority to take binding action on this issue. The county cannot abdicate its GMA responsibility for seawater intrusion designation to the planning group.

The Western Board also addressed expansion by San Juan County of a UGA into a critical aquifer recharge area and found, in light of the limitations of its ground water model and the data assembled to date, the studies done did not conclusively show that the increased densities of the UGA will not result in saltwater intrusion into the water supply. The Board held that the adaptive management program recommended by the advisory group is a necessary part of the County's protection strategy. Until the County completed these missing pieces, the Board found that the Lopez Village UGA failed to comply with RCW 36.70A.070(3)(a)-(d), RCW 36.70A.070(1), and RCW 36.70A.020(10) and (12).¹⁵⁴

Special Consideration for Anadromous Fisheries

Some aquifers may also have critical recharging effects on streams, lakes, and wetlands that provide critical fish and wildlife habitat. Protecting adequate recharge of these aquifers may provide additional benefits in maintaining fish and wildlife habitat conservation areas.¹⁵⁵

Critical aquifer recharge areas contribute to groundwater quality and in-stream flow. While critical aquifer recharge areas are designated and protected to ensure availability of potable water, the ground water resource also interacts with streams. Both discharge and recharge areas help to cool summer daytime temperatures and provide year round habitat for invertebrates, and important salmonid food source. Protecting aquifer recharge areas from stormwater pollution helps protect water quality for salmonids.

¹⁵⁴ *Stephen F. Ludwig v. San Juan County*, Case No. 05-2-0019c (FDO, Compliance Order, April 19, 2006)

¹⁵⁵ WAC 364-190-100(4)(c)