

Review of Best Available Science for 2004 Comprehensive Plan and Development Regulations Update

**Dave Christensen, Former Manager
Jefferson County Natural Resources Division***

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*Current contact information:
Dave Christensen, Water Quality Program Manager
Hood Canal Coordinating Council
(360) 301-9565
dave.christensen@earthlink.net

Background

The Washington State Growth Management Act (GMA) requires that cities and counties review and, if necessary, revise their development regulations periodically. Jefferson County is required by law to complete such a review before December 1, 2004.

The Washington Administrative Code (WAC) requires that cities and counties include the “best available science” (BAS) when developing policies and regulations to protect the functions and values of critical areas, and give “special consideration” for conservation of anadromous fish (WAC 365-195-900 through 925).

Purpose

The primary objective for this review of the best available science for Jefferson County’s development regulations was to identify and incorporate that information. Because Jefferson County had recently conducted a similar review of the best available science (Christensen, 2000), this review focused on relatively new information and not recreate a comprehensive overview; instead it acts as an update to include new information and current scientific thinking where it has changed.

This review includes new data that document conditions for fish and wildlife habitat in Jefferson County; it incorporates new state agency recommendations for wetlands, fish and wildlife habitat protection; and it includes several recommendations for changes to Jefferson County development regulations based on the new data and state agency recommendations. Some modifications are proposed to the Jefferson County Unified Development Code (UDC) as regulatory changes. Non-regulatory measures may be proposed as policy amendments to the Jefferson County Comprehensive Plan.

The primary new information includes:

- New stream typing information, incorporating 222-16-030 and 222-16-031 WAC
- Wildlife habitat data for eastern Jefferson County (Tomassi, 2004)
- Channel migration zone delineations conducted for the Duckabush, Dosewallips, Big Quilcene and Little Quilcene rivers (Perkins Geosciences, 2004)
- Washington Department of Community, Trade and Economic Development’s Critical Areas Assistance Handbook (CTED, 2003)
- BAS review for fish and wildlife habitat (Chris May, 2003)

A full list of resources reviewed can be found in the reference section at the end of this document. In general, this review relied heavily on the best available science reviews conducted by other jurisdictions, primarily King County. This paper is briefer. It focuses on issues and data that are pertinent to Jefferson County in particular. A more detailed overview of the current knowledge of science relating to sensitive area protection is found in the King County reviews (King County, 2004).

In this document, each environmentally sensitive element is separated into discrete components. However, the protective “framework” that Jefferson County uses in managing

its environmentally sensitive areas is a quilt of regulations, policies and incentives. The review takes into account the overlap in protections that exist between the discrete elements analyzed.

The elements in this best available science review include:

- Wetlands
- Fish and Wildlife Habitat Conservation Areas
- Aquifer Recharge and Wellhead Protection Areas
- Flood Hazard Areas
- Geologically Hazardous Areas

Section 1. Wetlands

Wetlands are integral features to the landscape of Jefferson County. They provide important habitat for fish and wildlife, reduce flooding to development, and help recharge the groundwater. In some areas, wetlands act as water storage and groundwater discharge points. These functions can be vital to support stream flows during times when the flows are the lowest. Still other wetlands are important at river mouths and along the marine shorelines. These estuarine and salt marsh wetlands are vital to the health of fish and wildlife populations; they are extremely productive and often act as nurseries, or areas where juveniles are able to forage and grow with protection from predators.

The role of a wetland, and its biological and ecological function in the watershed, relate directly to the classification of that particular wetland. The classification system translates into the protections provided to the wetland under the Jefferson County UDC. Jefferson County uses the rating system developed by the Department of Ecology which defines four classes of wetlands. Jefferson County also relies heavily on the recommendations from state agencies for standards to protect wetlands. The following recommendations are included in the Model Ordinance recommended by the Department of Community, Trade and Economic Development (CTED, 2003):

Table 1-1: Recommendations for Wetland Buffers (CTED, 2003)

Wetland Class	High Intensity	Moderate Intensity	Low Intensity
Category I	300'	250'	200'
Category II	200'	150'	100'
Category III	100'	75'	50'
Category IV	50'	35'	35'

The recommendations listed above represent a conservative (protective) assessment of the BAS. The range of buffers proposed to be protective of wetland functions is presented in a

Department of Ecology-initiated review of the BAS. It states that, “Synthesis documents that evaluated many studies of wetland buffers for habitat protection recommend buffers widths of 50 to 300 feet for most situations” (Sheldon et al., 2003).

The authors summarize that, “Effective buffer widths... generally should range from: 25 to 75 feet for wetlands with minimal habitat functions or adjacent low-intensity land uses; 50 to 150 feet for wetlands with moderate habitat functions or adjacent high-intensity land uses; and 150 to 300 feet for wetlands with high habitat functions” (Sheldon et al., 2003).

Therefore, based on the review of best available science, the following are recommendations for wetland protection buffers in Jefferson County:

Table 1-2. Recommended Wetland Buffers for Jefferson County

Wetland Class	Existing Std. Buffer	Existing Min. for Waiver	Recommended Std. Buffer	Recommended Min. for Waiver
Category I	150'	225'	200'	300'
Category II	100'	150'	100'	150'
Category III	50'	75'	50'	75'
Category IV	25'	37'	35'	52'

Jefferson County recognizes that Department of Ecology has revised wetland classification guidelines (Hruby, 2004). The existing wetland classification and protection schemes should be reviewed and modifications made to be consistent with the new draft classifications soon after the State Department of Ecology finalizes the classification methodology document. The new regulatory structure would require staff training before it could be effectively implemented and continue to provide protections to wetlands in Jefferson County.

Section 2. Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas are defined in the Growth Management Act as a critical area (RCW 36.70A.030(5)). Conserving and protecting fish and wildlife habitat requires land management decisions that maintain species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created; it does not mean maintaining all individuals of all species at all times (365-190-080(5) WAC). The State of Washington established guidelines regarding protection of Fish and Wildlife Habitat Conservation Areas, which Jefferson County has followed in the Comprehensive Plan and the associated development regulations in the UDC.

The BAS review conducted in October 2000 (Christensen, 2000) focused primarily on what would be appropriate riverine buffers to protect stream processes and functions. These processes, in turn, influence the quality and quantity of fish and wildlife habitat. The protections provided to fish and wildlife habitat are strongly influenced by anadromous fish

needs. Since the completion of the previous BAS review, several key documents regarding fish and wildlife habitat protections have been produced, and very recently the system of stream classification has been modified.

A. Stream Classification: The stream classification system used by the Washington State Department of Natural Resources has been modified. Appendix A (222-16-030 WAC) details how a new permanent classification system will be implemented. The stream classification system will become a permanent rule after adoption by the Forest Practices Board. In the interim, the 222-16-031 WAC contains an “interim” proposal for the classification system.

The existing UDC stream buffers are shown in Table 2-1, based on the water classification system ranging from Category 1 through Category 5:

Table 2-1. Existing UDC Stream Buffers

Existing Stream Buffers	
Water Type	Buffer
1	150'
2	150'
3	100'
4	100'
5	50'

Based on the interim and proposed stream classifications (222-16-030 and 031 WAC), and review of the BAS, the following recommendations are made for stream buffers for the UDC:

Table 2-2. Recommended Stream Buffers

New Recommended Buffers	
Water Type	Buffer
S	150'
F	150'
Np	100'
Ns	50'

As previously assessed, these recommended buffers will protect the vast majority of the functions provided by riparian vegetation to maintain high quality fish habitat and riverine functions. Several habitat-forming processes may be affected, although none are anticipated to cause significant impacts. Potentially, there could be some reduction in woody debris inputs, some microclimate impacts and water quality impacts for Type Ns streams. Overall,

the stream buffers as suggested are within the range of protective buffers suggested by the best available science.

The stream buffers recommendations also should account for the presence of Channel Migration Zones (CMZs). The CMZ is an area where natural riverine processes are allowed to distribute sediment, recruit woody debris, and provide high quality habitat for salmonids and other wildlife. Vegetation management in the CMZ should be regulated consistent with DNR Forest and Fish rules for timber harvest, which encourage the development of mature trees to provide a source of habitat-forming large woody debris (LWD). [222-30-020(12) WAC] The Forest and Fish Rules have been determined by a federal agency (NOAA-Fisheries) to be consistent with the best available science for protection of endangered species.

B. Marine Shorelines: The marine shorelines in Jefferson County are regulated under the Jefferson County Shoreline Master Program (SMP). These marine shorelines are, by definition, Fish and Wildlife Habitat Conservation Areas. In addition, marine nearshore waters contain important habitat for a number of anadromous salmonids. In fact, these nearshore marine waters have been defined by NOAA-Fisheries to be critical habitat for threatened summer chum salmon. Critical habitat for threatened or endangered species is defined in 365-190-080 WAC as a factor to determine whether habitat should be classified as Fish and Wildlife Habitat Conservation Area.

Jefferson County's nearshore ecosystem and adjacent uplands play a critical role in support of a wide variety of biological resources, many of which are commercially, culturally, aesthetically, and recreationally important to the people of the region. Examples include shellfish, fin-fish, birds and their prey.

Therefore, this review concludes that it is consistent with the best available science for Jefferson County to classify the nearshore marine waters that are defined as critical habitat for threatened or endangered species as Fish and Wildlife Habitat Conservation Areas in the UDC.

Although the marine shorelines are designated appropriately, two issues should be addressed in Jefferson County's development regulations. These two issues are 1) what are appropriate shoreline buffers and building setbacks, and 2) what are appropriate standards for bank protection that minimize negative habitat impacts.

In contrast to the well-understood functional dependence and relationships between streams and their riparian areas, there is a lack of basic scientific understanding of marine nearshore areas and adjacent uplands.

What is documented in the scientific literature is that the cumulative impact from development has altered our nearshore areas significantly. Williams and Thom (2001) summarize many of the expected relationships, what is known and not known. From this and other studies, below is a brief overview of what is known about relationships between nearshore marine areas and adjacent uplands:

- Sediment sources (often referred to as feeder bluffs) provide beach sands and gravels that move along the shorelines in drift cells. Both the source of sediment and the movement of sediment within drift cells can be negatively impacted by in-water structures such as piers, docks, rock groins and bulkheads.
- Disrupting the sediment transport processes changes the nature of the beach (sediment composition, slope, etc.) and negatively impacts habitat for forage fish spawning and possibly juvenile salmonids.
- Nearshore vegetation, especially large trees, provides shade. This shade has been shown to improve surf smelt (a type of a forage fish) egg survival rates because the eggs are exposed to air for long periods during the day during low tides in the summer.
- In a study conducted by King County, juvenile salmon were found to consume terrestrial insects, which shows the potential use of terrestrial food sources (and need for shoreline vegetation) by salmonids in nearshore marine waters. However, the study was limited in both geographic scope and duration and the results cannot be generalized without a great deal more study.
- From studies about vegetated buffers in freshwater systems, the same processes for filtering water quality contaminants, such as heavy metals and bacteria, would apply to vegetated riparian and marine areas.
- Estuaries have been shown to be critical for salmonid production. Impacts such as diking, draining, and restricting hydrologic exchange of the tides with culverts, have been shown to negatively impact Hood Canal summer chum and Puget Sound Chinook salmon, as well as other species.

However, several key factors are not well documented in the scientific literature:

- Does vegetation along marine shorelines increase or decrease sediment delivery to nearshore marine areas? Is this increase or decrease a positive or negative impact?
- How important is terrestrial-derived food to juvenile salmonids and other nearshore marine inhabitants? About 90% of nutrients used for primary production in Hood Canal are from marine sources (USGS, 2004). Primary production creates algae, which in turn leads to growth of zooplankton (food for forage fish and juvenile salmonids). It is difficult to generalize beyond Hood Canal, except that it is likely that Admiralty Inlet and the western coastal areas of Jefferson County are more influenced by oceanic nutrient sources than is Hood Canal. This would indicate that fisheries production, including salmonid production, is much more dependent on oceanic nutrients than land-based nutrients.
- In what ways are nearshore marine buffers similar and different compared to riverine systems? What are the ecological impacts? What are the critical functions that nearshore vegetation provides and how do various sizes and types of buffers maintain these functions?
- What role does buffer “quality” have? Do shrubs and grasses provide the same level of habitat quality that trees provide? Do conifers provide more habitat quality than deciduous trees?

In an attempt to make recommendations regarding appropriate development standards for uplands adjacent to marine shorelines, many scientists and state agencies have “borrowed” some of the knowledge and research about freshwater systems. Several processes for marine buffers would be similar to freshwater systems, and some would be expected to be different. The function whereby vegetated buffers protect water quality by removing pollutants is likely a similar process between freshwater and marine buffers. Other processes, such as temperature control, woody debris inputs, and erosion control seem to have less applicability in marine systems.

Based on water quality protection, vegetated buffers of 50 to 100 feet would be recommended by the literature as protecting water quality. Therefore, the recommendation for the Jefferson County UDC is:

- 50’ native vegetation buffer. In this buffer, normal pruning of trees and minor modifications to vegetation should be allowed, consistent with the existing UDC restrictions allowed in buffer zones.
- 50’ vegetated “managed” buffer. In this section, native vegetation should be encouraged. Some accessory structures could be allowed, but with the majority of the buffer should be maintained in vegetation (which would include lawns). Use of pesticides and fertilizers should be prohibited in the managed buffer to protect water quality.

Continued development along riverine and marine shoreline can negatively impact salmonid habitat if that development also includes bank protection, or hard bank armor, that functionally changes the beach, the nearshore, sediment processes, etc.

The current regulations in the State Shoreline Management Act allow for protection of residential structures and infrastructure such as roads from natural land movements. This use of bank armoring should be limited to situations where more natural “soft” bank protection measures cannot be used. The Jefferson County code should discourage the use of hard bank armoring unless study by a geotechnical engineer determines that natural approaches will not be effective for the overall goal of bank stabilization and protection, and impacts to habitat can be effectively prevented or mitigated.

C. Wildlife Habitat: Jefferson County protects various wildlife species through designation and protection of select breeding and key foraging habitats as environmentally sensitive areas, based on the Priority Habitats and Species datasets provided by the Washington Department of Fish and Wildlife (WDFW). In addition to these specific sites to be protected, Jefferson County recently conducted a study to assess wildlife habitat based on a multi-species analysis to protect high quality habitat patches and corridors (Tomassi, 2004).

Jefferson County is still largely undeveloped. The Olympic National Park accounts for about 46 percent of the land area within the county. Federal and state forestlands account for an additional 31 percent of the land area, and private forestlands comprise an additional 12 percent of long-term forested habitat. Therefore, the goal of identifying Core Wildlife

Habitat areas was to identify high quality habitat on the remaining 11% of the county lands that are comprised of residential, commercial and agricultural lands. The focus for the wildlife habitat study was on habitat that provided connections to existing high quality habitat and allowed for breeding, migration and foraging. Within these identified “core” habitat areas, the long-term goal should be to protect wildlife habitat quality and quantity by using appropriate zoning, incentives and regulatory tools.

Using the identified core habitat areas, existing protected open space, forestry lands and riparian zones, Jefferson County has developed a type of “wildlife habitat network.” This network is a series of connected high quality habitat patches (Core 1 Wildlife Habitat and Core 2 Wildlife Habitat areas) and vegetated corridors throughout the county (Tomassi, 2004). This habitat network links high quality habitat in the Olympic National Park and Olympic National Forest to high quality wildlife habitat in the lowlands. The network width is three hundred feet or wider at all parts and is contiguous with existing mapped environmentally sensitive areas.

According to the review of the best available science, Jefferson County will be able to maintain wildlife habitat through a series of protection standards detailed below.

To protect the designated Core Wildlife Habitat and Wildlife Habitat Corridors for eastern Jefferson County, Jefferson County should use a combination of public education and incentives for individual property owners, with regulatory controls focused on subdivision and forest practice standards.

(i) Subdivision standards: Applicants completing subdivisions within Core 1 and Core 2 Wildlife Habitat areas and wildlife habitat corridors should be encouraged to develop Planned Rural Residential Developments (PRRDs). These developments cluster homes on smaller parcels and then dedicate large areas for open space. The PRRD provisions will protect wildlife habitat from fragmentation, while still allowing for the highest and best use of private property, including density bonuses for protecting valuable wildlife habitat.

If applicants wish to subdivide under Section 7 of the UDC, they should be required to complete a Habitat Management Plan that demonstrates the subdivision will not fragment core wildlife habitat or the wildlife habitat corridors.

Applicants requesting a Comprehensive Plan amendment to rezone residential lands to higher densities or into rural commercial lands should be required to assess how the more intensive use will protect wildlife habitat, if the rezone is within a core wildlife habitat area or wildlife habitat corridor. Jefferson County should analyze if it would be advantageous to use transfer of development rights (TDRs) program within core wildlife habitat areas versus approving Comprehensive Plan amendments that create more intensive development in these critical wildlife habitats.

(ii) Forestry: Much of the need for protecting wildlife habitat is in preserving forested stands and preventing fragmentation of wildlife habitat (CTED, 2003;

Tomassi, 2004). Jefferson County should complete an assessment to determine if accepting sole regulatory authority for Class IV Forest Practices permitting would protect wildlife habitat more effectively than the current regulatory structure.

Landowners should be required to maintain a mixture of stand age classes, providing complex habitat and still allowing for timber harvest and conversion to non-forestry uses.

Incentives: Jefferson County will need to continue to provide and even improve the education and incentives available landowners in the wildlife habitat network. The types of tools that should be developed include:

- Wildlife management guidelines for site development and planning;
- Incentives for preservation of priority habitats, including the possibility of using Conservation Futures Tax Funds to compensate landowners;
- Financial incentives to garner protection of priority habitats. Landowners may receive tax benefits through the classification of their property in one of several “Open Space” categories, which could be based more specifically on a Public Benefits Rating System.

Section 3. Aquifer Recharge Areas

Review of the CTED guidance documents indicate that Jefferson County is currently following the best available science in regard to protection standards for Aquifer Recharge Areas.

Section 4. Flood Hazard Areas

Jefferson County is currently involved with a comprehensive planning process for emergency management in cooperation with the City of Port Townsend and special districts county-wide. Any regulatory changes related to Flood Hazard Areas will be updated at the culmination of the process.

Section 5. Geologically Hazardous Areas

The review of the best available science for geologic hazard areas indicates that Jefferson County is generally consistent in regulating these areas. However, Jefferson County should incorporate a key additional component into its regulatory structure. Jefferson County should limit the development of residential and commercial structures in the riverine “channel migration zone” (CMZ).

In 2004, Perkins Geosciences and the US Bureau of Reclamation completed a study that mapped channel migration zones (CMZs) for Jefferson County on major east Jefferson County rivers, including the Duckabush, Dosewallips, Big Quilcene and Little Quilcene (Perkins Geosciences, 2004).

Channel migration creates hazards to private and public property and infrastructure by eroding land or cutting off access roads. In the history of Jefferson County, countless levees and revetments were built to prevent channel migration, often at considerable public expense. Where it still occurs, channel migration creates habitat for fish and other riparian species by leaving behind a diverse network of relict channels, gravel bars, floodplains and terraces.

The purpose of including CMZs as an environmentally sensitive area is that development in the CMZ is a public safety risk. Structures built in the CMZ have a potential of being destroyed by channel movements. The risks of this occurring have been defined as a high probability or moderate probability according to the report (Perkins Geosciences, 2004).

To meet guidelines in the best available science, development should be discouraged in the CMZs. In high risk CMZs, buildings should be set back to the edge of extent of the high risk CMZ. If this condition cannot be met, then strict conditions should be issued which notify the current and future property owners of the risk, prevent the property owner from restricting channel migration, and indemnify the County for property losses. Vegetation management in the CMZ should be regulated consistent with DNR Forest and Fish rules for timber harvest, which encourage the development of mature trees to provide a source of habitat-forming LWD.

Reference List

Fish and Wildlife Habitat Conservation Areas

- Ames, J. *et al.* 2000, Summer Chum Salmon Conservation Initiative. Washington Department of Fish and Wildlife/Point No Point Treaty Tribes. Kingston, WA.
- Christensen, David, 2000. Protection of Riparian Ecosystems: A Review of Best Available Science. Jefferson County Natural Resources Division. Port Townsend, WA.
- Glasoe, Stuart and Aimee Christy, June 2004. Coastal Urbanization and Microbial Contamination of Shellfish Growing Areas. Puget Sound Action Team Publication #PSAT 04-09.
- King County, 2004. Best Available Science, Volume 1, A Review of Science Literature. Chapter 7: Aquatic Areas. Department of Natural Resources and Parks. Seattle, WA.
- King County, 2004. Best Available Science, Volume 1, A Review of Science Literature. Chapter 8: Wildlife Areas. Department of Natural Resources and Parks. Seattle, WA.
- May, Christopher, 2003. Stream-Riparian Ecosystems in the Puget Lowland Eco-Region: A Review of Best Available Science. Watershed Ecology, LLC.
- May, C. and G. Peterson, 2003. East Jefferson County Refugia Report. Prepared for Jefferson County. Port Townsend, WA.
- Tomassi, S., 2004. Management Strategies for Core Wildlife Habitat Areas in Eastern Jefferson County. Prepared for Jefferson County, Port Townsend, WA.
- URS, 2002. Best Available Science Review, 2002 Revision of Pierce County Critical Areas Ordinance. Prepared for Pierce County Planning and Land Services. Seattle, WA.
- USGS, 2004. An Analysis of Nitrogen Loads to Hood Canal. Preliminary Report. Tacoma Washington. Can be accessed at: [USGS - Hood Canal - Publications and Products](#)
- Washington State Department of Community Trade and Economic Development (CTED), 2002. Citations of Sources of Best Available Science for Designating and Protecting Critical Areas. Office of Community Development. Olympia, WA.
- Washington State Department of Community Trade and Economic Development (CTED), 2003. Critical Areas Assistance Handbook: Protecting Critical Areas Within the Framework of the Washington State Growth Management Act. Office of Community Development. November, 2003. Olympia, WA.

Williams, Gregory and Ronald Thom, 2001. Marine and Estuarine Shoreline Modification Issues. Submitted to WDFW, WDOE and WDOT. Battelle Marine Sciences Laboratory. Sequim, WA.

Wetlands

Hruby, Thomas. 2004. Washington State Wetland Rating System for Western Washington Revised. April 2004 Draft. Ecology Publication #04-06-014. Olympia, WA.

King County. 2004. Best Available Science, Volume 1, A Review of Science Literature. Chapter 9: Wetlands. Department of Natural Resources and Parks. Seattle, WA.

May, Christopher. 2003. Stream-Riparian Ecosystems in the Puget Lowland Eco-Region: A Review of Best Available Science. Watershed Ecology, LLC.

Sheldon, Dyanne *et al.* August 2003 Draft. Freshwater Wetlands in Washington State Volume 1: A Synthesis of the Science. Washington State Department of Ecology Publication #03-06-016. Olympia, WA.

Tomassi, S. 2004. Management Strategies for Core Wildlife Habitat Areas in Eastern Jefferson County. Prepared for Jefferson County, Port Townsend, WA.

URS. 2002. Best Available Science Review, 2002 Revision of Pierce County Critical Areas Ordinance. Prepared for Pierce County Planning and Land Services. Seattle, WA.

Washington State Department of Community Trade and Economic Development (CTED). 2002. Citations of Sources of Best Available Science for Designating and Protecting Critical Areas. Office of Community Development. Olympia, WA.

Washington State Department of Community Trade and Economic Development (CTED), 2003. Critical Areas Assistance Handbook: Protecting Critical Areas Within the Framework of the Washington State Growth Management Act. Office of Community Development. November, 2003. Olympia, WA.

Channel Migration

King County. 2004. Best Available Science, Volume 1, A Review of Science Literature. Chapter 4: Channel Migration Zones. Department of Natural Resources and Parks. Seattle, WA.

Perkins Geoscience. 2004. Channel Migration Hazard Maps for the Dosewallips, Duckabush, Big Quilcene and Little Quilcene Rivers, Jefferson County, Washington. Seattle, WA.

Rapp, C. and T. Abbe. 2003. A Framework for Delineating Channel Migration Zones. Washington State Department of Ecology Final Draft Publication #03-06-027. Olympia, WA.

URS. 2002. Best Available Science Review, 2002 Revision of Pierce County Critical Areas Ordinance. Prepared for Pierce County Planning and Land Services. Seattle, WA.

US Department of the Interior, Bureau of Reclamation. 2004. Channel Migration Zone Study for the Duckabush, Dosewallips, Big Quilcene and Little Quilcene Rivers, Jefferson County, Washington. Denver, CO.

Washington State Department of Community Trade and Economic Development (CTED). 2002. Citations of Sources of Best Available Science for Designating and Protecting Critical Areas. Office of Community Development. Olympia, WA.

Washington State Department of Community Trade and Economic Development (CTED), 2003. Critical Areas Assistance Handbook: Protecting Critical Areas Within the Framework of the Washington State Growth Management Act. Office of Community Development. November, 2003. Olympia, WA.

Washington State Department of Natural Resources. 1999. Forest and Fish Report. Olympia, WA.

Appendix A. Water Typing

WAC 222-16-030 Water typing system. Until the fish habitat water type maps described below are adopted by the board, the Interim Water Typing System established in WAC [222-16-031](#) will continue to be used.

***(1) "Type S Water"** means all waters, within their bankfull width, as inventoried as "shorelines of the state" under chapter [90.58](#) RCW and the rules promulgated pursuant to chapter [90.58](#) RCW including periodically inundated areas of their associated wetlands.

***(2) "Type F Water"** means segments of natural waters other than Type S Waters, which are within the bankfull widths of defined channels and periodically inundated areas of their associated wetlands, or within lakes, ponds, or impoundments having a surface area of 0.5 acre or greater at seasonal low water and which in any case contain fish habitat or are described by one of the following four categories:

(a) Waters, which are diverted for domestic use by more than 10 residential or camping units or by a public accommodation facility licensed to serve more than 10 persons, where such diversion is determined by the department to be a valid appropriation of water and the only practical water source for such users. Such waters shall be considered to be Type F Water upstream from the point of such diversion for 1,500 feet or until the drainage area is reduced by 50 percent, whichever is less;

(b) Waters, which are diverted for use by federal, state, tribal or private fish hatcheries. Such waters shall be considered Type F Water upstream from the point of diversion for 1,500 feet, including tributaries if highly significant for protection of downstream water quality. The department may allow additional harvest beyond the requirements of Type F Water designation provided the department determines after a landowner-requested on-site assessment by the department of fish and wildlife, department of ecology, the affected tribes and interested parties that:

(i) The management practices proposed by the landowner will adequately protect water quality for the fish hatchery; and

(ii) Such additional harvest meets the requirements of the water type designation that would apply in the absence of the hatchery;

(c) Waters, which are within a federal, state, local, or private campground having more than 10 camping units: Provided, That the water shall not be considered to enter a campground until it reaches the boundary of the park lands available for public use and comes within 100 feet of a camping unit, trail or other park improvement;

(d) Riverine ponds, wall-based channels, and other channel features that are used by fish for off-channel habitat. These areas are critical to the maintenance of optimum survival of fish. This habitat shall be identified based on the following criteria:

(i) The site must be connected to a fish habitat stream and accessible during some period of the year; and

(ii) The off-channel water must be accessible to fish.

(3) **"Type Np Water"** means all segments of natural waters within the bankfull width of defined channels that are perennial nonfish habitat streams. Perennial streams are waters that do not go dry any time of a year of normal rainfall. However, for the purpose of water typing, Type Np Waters include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow. If the uppermost point of perennial flow cannot be identified with simple, nontechnical observations (see board manual, section 23), then Type Np Waters begin at a point along the channel where the contributing basin area is:

(a) At least 13 acres in the Western Washington coastal zone (which corresponds to the Sitka spruce zone defined in Franklin and Dyrness, 1973);

(b) At least 52 acres in other locations in Western Washington;

(c) At least 300 acres in Eastern Washington.

(4) **"Type Ns Water"** means all segments of natural waters within the bankfull width of the defined channels that are not Type S, F, or Np Waters. These are seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and are not located downstream from any stream reach that is a Type Np Water. Ns Waters must be physically connected by an above-ground channel system to Type S, F, or Np Waters.

* (5) For purposes of this section:

(a) "Residential unit" means a home, apartment, residential condominium unit or mobile home, serving as the principal place of residence.

(b) "Camping unit" means an area intended and used for:

(i) Overnight camping or picnicking by the public containing at least a fireplace, picnic table and access to water and sanitary facilities; or

(ii) A permanent home or condominium unit or mobile home not qualifying as a "residential unit" because of part time occupancy.

(c) "Public accommodation facility" means a business establishment open to and licensed to serve the public, such as a restaurant, tavern, motel or hotel.

(d) "Natural waters" only excludes water conveyance systems which are artificially constructed and actively maintained for irrigation.

(e) "Seasonal low flow" and "seasonal low water" mean the conditions of the 7-day, 2-year low water situation, as measured or estimated by accepted hydrologic techniques recognized by the department.

(f) "Channel width and gradient" means a measurement over a representative section of at least 500 linear feet with at least 10 evenly spaced measurement points along the normal stream channel but excluding unusually wide areas of negligible gradient such as marshy or swampy areas, beaver ponds and impoundments. Channel gradient may be determined utilizing stream profiles plotted from United States geological survey topographic maps (see board manual section 23).

(g) "Intermittent streams" means those segments of streams that normally go dry.

(h) "Fish habitat" means habitat which is used by any fish at any life stage at any time of the year, including potential habitat likely to be used by fish which could be recovered by restoration or management and includes off-channel habitat.

WAC 222-16-031 Interim water typing system. Until the fish habitat water type maps mentioned above are available, waters will be classified according to the interim water typing system described below.

Water Type Conversion Table

Permanent Water Typing	Interim Water Typing
Type "S"	Type 1 Water
Type "F"	Type 2 and 3 Water
Type "Np"	Type 4 Water
Type "Ns"	Type 5 Water