

6. 20-Acre Exempt Riparian Forestland

6.1 Introduction

The 1999 Washington State Legislature exempted certain forestland parcels from some riparian protection measures in the Forest Practices Rules that resulted from the 1999 Forests and Fish Report. Exempt parcels include those that are 20 contiguous acres or less and are owned by individuals whose total ownership is less than 80 forested acres statewide. These parcels are commonly referred to as “exempt 20-acre parcels.” While not subject to some forest practices riparian protection rules, exempt 20-acre parcels must still provide protection for public resources in accordance with the Forest Practices Act.

In arriving at their permitting decisions, the federal Services concluded that they would condition the Incidental Take Permits regarding 20-acre exempt forest practices. Conditions include:

- Requiring leave trees be left along Type Np (non-fish-bearing, perennial) waters for riparian function.
- Providing eligibility criteria for coverage of 20-acre exempt parcels under the Incidental Take Permits.
- Defining coverage thresholds for 20-acre exempt parcels in each watershed administrative unit and water resource inventory area.
- Identifying certain spawning and rearing habitat of bull trout (also known as “Bull Trout Areas of Concern”) where Incidental Take Permit coverage may not apply.

6.2 Type Np Water Leave Tree Requirement

[By Washington State Regulation](#), DNR requires trees to be left on Np (non-fish-bearing, perennial) waters on 20-acre exempt parcels where needed to protect public resources, defined as water, fish, and wildlife. The Services concluded that leaving trees along Np waters is necessary in most situations. The Forest Practices HCP Incidental Take Permits says that “permittee (Washington State) shall require trees to be left along Type Np waters under the 20-acre exemption unless such leave trees are not necessary to protect covered species (public resources) and their habitats.” In order to implement this permit condition, a guidance memo was written September 26, 2006 and delivered to DNR region forest practices staff clarifying that “henceforth Forest Practices Applications should be conditioned to require leave trees along Type Np waters within exempt 20-acre parcels unless DNR determines this is not necessary”. See the 2007 Forest Practices HCP Annual Report for a copy of the guidance memo. Leave tree requirements are detailed in WAC 222-30-023(3): “...leave at least 29 conifer or deciduous trees, 6 inches in diameter or larger, on each side of every 1000 feet of stream length within 29 feet of the stream. The leave trees may be arranged to accommodate the operation.”

There were six Forest Practices Applications associated with 20-acre exempt parcels that had Type Np waters during FY 2012 (July 1, 2012 to June 30, 2013). Three of the applications were either conditioned according to the Np guidance memo (which reflects WAC 222-30-023(3)) or

did not propose harvest within 29 feet of the Np water. Two did not have the statement on the FPA and one had an incorrect statement on the FPA.

6.3 Watershed Administrative Unit and Water Resource Inventory Area Thresholds

In the Incidental Take Permits, the Services defined permit coverage thresholds for watershed administrative units (WAU) and water resource inventory areas (WRIA). The Services placed a 10 percent threshold on cumulative reduction in riparian function (as measured by the amount of recruitable large woody debris such as snags and tall trees that could fall across a stream or other water body) within a watershed administrative unit for 20-acre exempt parcels. Additionally, the Services placed a 15 percent stream length threshold within water resource inventory areas. The 15 percent threshold is based on the cumulative stream length of the affected streams within each WAU in the WRIA that has reached the 10 percent threshold. When a threshold within a watershed administrative unit or water resource inventory area is reached, subsequent Forest Practices Applications on 20-acre exempt parcels within those units or inventory areas will not be covered by the Incidental Take Permits unless the landowner chooses to follow standard Riparian Management Zone (RMZ) rules. Washington State has adopted a method, approved by the Services, to estimate cumulative percent reduction of potential large woody debris recruitment function, by watershed administrative unit, and percent cumulative stream length affected, by water resource inventory area.

6.4 Cumulative Reduction in Function Calculation Methodology

A formula called the Equivalent Area Buffer Index (Buffer Index) is used to estimate the percent reduction in function, as measured by potential large woody debris that could be recruited along fish-bearing streams. The Buffer Index was developed for the Forest Practices HCP [Environmental Impact Statement](#) (EIS) (USFWS et. al 2006) as a tool for comparing management alternatives in terms of the level of ecological function conserved through various management practices. The Buffer Index for large woody debris recruitment potential is a quantitative measure that evaluates the potential of a riparian forest to provide trees and other woody debris across and into streams originating from tree mortality, windthrow and bank undercutting. The Buffer Index is expressed as a function of slope distance from the stream channel in relationship to tree height. The methodology takes into account management activities within the buffer zone. The Buffer Index value is determined based upon the 'mature conifer curve of large woody debris recruitment potential' by McDade et al (1990). It relates the cumulative percent of large woody debris recruitment with the distance from the stream bank in terms of tree height. The Environmental Impact Statement (EIS) for the Forest Practices HCP provides average Buffer Indexes for western and eastern Washington. These averages are used each year to estimate the potential cumulative reduction in large woody debris recruitment function from 20-ac exempt Forest Practices Applications submitted to DNR during the fiscal year.

Example explaining Buffer Index formula for fish-bearing stream in Western Washington

- **Step 1 — Consider a fish-bearing stream (Type F).**

The assumptions for this stream's Riparian Management Zone include a Channel Migration Zone (CMZ) that is 10-foot wide, followed by a 50-foot core zone of forest along the stream, followed by a 60-foot inner forest zone in which a light selection harvest is assumed (30 percent volume removal), followed by a 45-foot outer zone in which a moderately heavy selection harvest is assumed (70 percent volume removal). This gives a total RMZ width of 155 feet including the 10-foot CMZ. The total RMZ width of 155 feet is based on an average of Site Class II and III areas $[(140+170)/2]$, which represent the most common site classes on forestland covered by the Incidental Take Permits.

- **Step 2 — Next refer to the McDade (1990) mature conifer curve.**

The McDade curve has been standardized for 155 feet, as the buffer distance that assumes full protection for the 100-year Site Potential Tree Height. This curve shows the cumulative percentage of large woody debris contribution in relation to the distance from the stream. In our example, we need to determine the percent of the total large woody debris contributed by the different RMZ zones (e.g., 0-10 feet, 10-60 feet, 60-120 feet and 120-165 feet). The values from McDade are 17 percent for the 0-10 foot zone, 62 percent for the 10-60 foot zone, 18 percent for the 60-120 foot zone, and 3 percent for the 120-165 foot zone.

- **Step 3 — Last, multiply the contribution percentage by the tree retention percentage for each RMZ zone, and sum them up.**

$$(0.17 \times 1.0) + (0.62 \times 1.0) + (0.18 \times 0.7) + (0.03 \times 0.3) = 0.925$$

- **Step 4 — Results**

Therefore, the RMZ on Type F streams in Western Washington would provide for an estimated 92.5 percent of large woody debris recruitment potential, given the assumption that full recruitment potential is achieved at a buffer width equal to the 100-year Site Potential Tree Height.

Annual in-office calculations of reduction in function based on proposed harvests

An estimate of potential reduction in function by watershed administrative unit is calculated annually and reported in the Forest Practices HCP annual report. The impact is "potential" because the calculations are based on "proposed" harvests, not "completed" harvests and estimates of stream impact are made in-office from information supplied on the Forest Practices Applications (FPA), not on-the-ground measurements. Average Buffer Index values are used to calculate the overall possible reduction in function by watershed administrative unit (WAU). The average Buffer Index values used for the annual report calculations are taken from the Final EIS (Appendix B page B-28) for the Forest Practices HCP. These average Buffer Index values were obtained through modeling harvests based on both Forests and Fish Rules, and pre-Forests and Fish Rules. Many assumptions went into the modeling effort including degree of harvest, width of riparian area, stream width, etc. An end result of the harvest modeling was the development of average values for an overall Buffer Index for eastern and western Washington for harvests complying with Forests and Fish Rules, as well as with pre-Forests and Fish Rules.

The EIS average Buffer Index values for Forests and Fish Rules are used in our calculations without modification; however, an additional 15 percent was added to the EIS average Buffer Index values for pre-Forests and Fish Rules because the 1999 Salmon Recovery Act required 20-acre exempt landowners to protect an additional 15 percent of riparian trees above pre-Forests and Fish Rules. The average reduction in function value was calculated by subtracting the pre-Forests and Fish Rules Buffer Index values from the Forests and Fish Rules Buffer Index values for a percent reduction in function.

Below are the Buffer Index values and reduction in function factors used for the Forest Practices HCP Annual Report.

Buffer Indexes for Western Washington:

Buffer Index average for Forests and Fish Rules = 0.93

Buffer Index average for Rules prior to Forests and Fish = 0.60

Buffer Index average for 20-acre exempt rules = $0.60 \times 1.15 = 0.69$

Average Reduction in function factor = $0.93 - 0.69 = 0.24$

Buffer Indexes for Eastern Washington:

Buffer Index average for Forests and Fish Rules = 0.91

Buffer Index average for Rules prior to Forests and Fish = 0.67

Buffer Index average for 20-acre exempt rules = $0.67 \times 1.15 = 0.77$

Average Reduction in function factor = $0.91 - 0.77 = 0.14$

The estimated number of feet of fish bearing stream potentially affected by harvests through Forest Practices Applications is tracked throughout the year. The total number of feet of stream length in each watershed administrative unit is calculated for the fiscal year and then multiplied by 0.24 in Western Washington and 0.14 in Eastern Washington to derive the total stream distance over which large woody debris recruitment functions are reduced in function. These numbers are summed over the years and then divided by the GIS calculated total fish bearing stream length on lands regulated by forest practices in the watershed administrative unit to determine potential percent cumulative reduction in function

The following table contains the cumulative in-office estimates of reduction in function by watershed administrative unit for the time period of June 5, 2006, to June 30, 2013. A visual representation of the 20-acre Exempt Forest Practices Applications accounted for in the following table can be found in Appendices #2a and #2b. The two maps in these appendices show the location of the 20-acre exempt applications for FY 2013 and the location of all 20-acre exempt applications since June 2006. Maps showing 20-acre exempt Forest Practices Applications in previous fiscal years can be found in previous Forest Practices HCP annual reports.

**Estimated Potential Percent Loss of
Large Woody Debris Recruitment Potential,
by Watershed Administrative Unit**

Watershed Administrative Unit	Percent (%) Reduction in LWD Function in WAU
Abernathy	0.034
Acme	0.052
Antonie Creek	0.019
Bangor-Port Gamble	0.047
Bellingham Bay	0.066
Bogachiel	0.051
Blanchard Creek	0.040
Bunker Creek	0.097
Carbon	0.046
Carpenter	0.081
Cathlapotl	0.150
Cedar Creek/Chelatchie Creek	0.346
Chehalis Headwaters	0.006
Chehalis Slough	0.191
Chinook	0.021
Church Creek	0.333
Coal Creek	0.092
Colvos Passage/Carr Inlet	0.066
Conboy	0.028
Connelly	0.166
Corkindale	0.097
Cottonwood Creek	0.017
Cowlitz River/Mill Creek	0.084
Damfino	0.144
Davis Creek	0.077
Day Creek	0.247
Deadman Creek/Peone Creek	0.126
Delameter	0.005
Delezene Creek	0.099
Diobsud Creek	2.307
Discovery Bay	0.033
Dragoon Creek	0.031
Drayton	0.284
Dyes Inlet	0.131
East Creek	0.031
East Fork Humptulips	0.099
EF Satsop	0.005
Electron	0.021
Elk River	0.007
Everett	0.056
Ferndale	0.179
French-Boulder	0.037
Friday Creek	0.729
Gibson Ck.	0.047
Gilligan	0.095

**Estimated Potential Percent Loss of
Large Woody Debris Recruitment Potential,
by Watershed Administrative Unit**

Watershed Administrative Unit	Percent (%) Reduction in LWD Function in WAU
Grays Bay	0.034
Great Bend	0.018
Haller Creek	0.049
Hamilton Creek	0.045
Hansen Creek	0.320
Harstine Island	0.106
Hoko	0.004
Hope Creek	0.013
Horseshoe Falls	0.334
Huckleberry Creek	0.019
Hutchinson Creek	0.131
Independence Creek	0.152
Jim Creek	0.033
Johns River	0.052
Jordan	0.080
Key Peninsula	0.021
Kiona	0.086
L.Snoqualmie River/Cherry Creek	0.005
Lacamas	0.093
Lacamas Lake	0.254
Lake Merwin	0.162
Lake Whatcom	0.070
Liberty Miller - Appletree	0.125
Lilliwaup	0.004
Lincoln Creek	0.036
Little Deep Creek	0.046
Little Spokane/Deer Creek	0.038
Little Washougal	0.106
Long Beach	0.085
Lost Creek	0.905
Lower Chehalis/Elizabeth Creek	0.013
Lower Coweeman	0.101
Lower Cowlitz	0.084
Lower Deschutes	0.013
Lower Dosewallips	0.172
Lower Humptulips River	0.026
Lower Kalama	0.070
Lower Naselle	0.023
Lower NF Stilly	0.055
Lower Newaukum	0.346
Lower Pilchuck Creek	0.158
Lower Pilchuck River	0.196
Lower Quinault	0.665
Lower Riffe Lake	0.066
Lower Skokomish	0.066

**Estimated Potential Percent Loss of
Large Woody Debris Recruitment Potential,
by Watershed Administrative Unit**

Watershed Administrative Unit	Percent (%) Reduction in LWD Function in WAU
Lower Snoqualmie River/Cherry Crk.	0.088
Lower Willapa	0.166
Lynch Cove	0.183
Mashel	0.039
Mason	0.098
MF Satsop	0.034
Middle Humptulips	0.043
Middle Sauk	0.021
Mill Creek	0.019
Mill Creek/Clugton Creek	0.032
Mitchel	0.038
Mox Chehalis	0.107
Mt Zion	0.032
Muck Creek	0.006
Naselle Headwaters	0.004
Nemah	0.038
NF Granite Creek	0.034
Nineteen Creek	0.190
Nookachamps	0.014
North Headwaters	0.049
North-Middle Forks Deer Creek	0.059
Olequa	0.188
Ostrander	0.216
Otter Creek	0.041
Packwood Lake	0.245
Patit Creek	0.052
Pend Oreille/Cedar Creek	0.040
Pilchuck Mtn.	0.013
Port Angeles	0.103
Porter Canyon	0.031
Possession Sound-N. Elliot Creek	0.139
Quilceda Creek	0.182
Quillisascut Creek	0.126
Quinault Lake	0.114
Reese Creek	0.037
Rock Creek	0.135
S. Sinclair Inlet	0.032
Salmon Creek	0.046
Salt Creek	0.212
Samish Bay	0.090
Samish River	0.112
Satsop	0.102
Scatter Creek	0.011
Sekiu	0.022
Siebert McDonald	0.063

Estimated Potential Percent Loss of Large Woody Debris Recruitment Potential, by Watershed Administrative Unit	
Watershed Administrative Unit	Percent (%) Reduction in LWD Function in WAU
SF Skokomish	0.061
SF Skykomish River	0.020
SF Willapa	0.017
Silver Lake	0.163
Smith Creek	0.021
Smith Point	0.602
Sol Duc Valley	0.014
Squalicum Creek	0.071
St. Peter-Lambert	0.025
Stillaguamish Flats	0.016
Sultan River	0.042
Sumas River	0.121
Sutherland Aldwell	0.168
Tacoma Creek	0.103
Tanwax Creek	0.128
Toandos Peninsula	0.034
Toutle River	0.125
Upper Chehalis/Rock Creek	0.009
Upper Coweeman	0.033
Upper NF Stilly	0.071
Vancouver	0.478
Vashon Island	0.050
Vedder	0.761
Verlot	0.053
Vesta Little N.	0.005
Whidbey Island	0.125
Wilkeson	0.032
Winston Creek	0.024
W. Kitsap	0.008
Wishkah Headwaters	0.081
Woodland Creek	0.199
Woods Creek	0.063
Wynochee River System	0.010
Yacolt	0.138
Yelm Creek	0.085

The table above shows estimated percent of loss of potential large woody debris recruitment in each watershed administrative unit containing one or more Forest Practices Applications (FPAs) over the elapsed seven year period of the Incidental Take Permits. There are a total of 846 watershed administrative units in the state, of which 170 have some measure of reduction in potential recruitment function. Currently, in-office calculations indicate that each watershed administrative unit affected by 20-Acre Exempt applications, except for one, has less than one percent cumulative reduction in function. The largest possible impact is in Diobsud Creek

Watershed Administrative Unit in the Upper Skagit Watershed Resource Inventory Area (WRIA), which only has a total of 36,394 feet of fish-bearing stream in the entire watershed unit. In-office calculations of proposed applications show a possible 2.3 percent potential reduction of large woody debris recruitment function in Diobsud Creek unit. The Lost Creek unit in the Sanpoil WRIA, with 23,172 feet of fish-bearing stream, shows a possibility of 0.9 percent potential reduction of large woody debris recruitment function. There also are two watershed units that indicate a potential of 0.7 percent reduction in function; two at 0.6 percent, one at 0.4 percent; five at 0.3 percent; six at 0.2 percent; and thirty-nine at 0.1 percent. All other watershed administrative units listed in the above table show the possibility of less than 0.1 percent reduction in function since the 2006 issuance of the Incidental Take Permits.

6.5 Data Collection for Watershed Administrative Unit Threshold Reduction in Function within Watershed Administrative Units

A non-scientific field review was initiated in September 2008 on a subset of 20-acre exempt Forest Practices Applications to help verify that the in-office method for estimating reduction in function is sufficient. In past annual reports the State has provided information from these field reports. With the Compliance Monitoring Program focus on 20-acre exempt applications (see 2008 and 2012 reports), the 20-acre exempt chapter in the FPHCP Annual Report will defer reporting on this topic.

Cumulative Stream Length for Water Resource Inventory Areas

A fish-bearing stream baseline length was calculated for all Water Resource Inventory Areas (WRIAs). As in-office calculations indicate that the 10 percent threshold may be approaching in watershed administrative area, DNR will compare the total stream length in each watershed administrative unit to determine when the 15 percent threshold might be reached for the water resource inventory area. DNR then will inform landowners that subsequent Forest Practices Applications associated with 20-Acre Exempt parcels within the area no longer will be covered by the Incidental Take Permits, unless individual landowners choose to apply standard Riparian Management Zone rules on their 20-Acre Exempt forest practice. Currently, there are no watershed administrative units approaching the 10 percent threshold for reduction in function; therefore, no areas currently are at risk for reaching the 15 percent stream threshold.

6.6 Bull Trout Areas of Concern

The federal Services placed conditions on the Incidental Take Permits regarding specific, identified spawning and rearing habitat areas for bull trout. These areas are of concern because of extremely low populations of bull trout. The condition states that a forest practice that qualifies for and uses the 20-Acre Exempt riparian rules and falls within these bull trout areas of concern will not be covered by the Incidental Take Permits unless the forest practice is shown to not measurably diminish the level of riparian function. The function is measured by potential large woody debris recruitment and is compared to the level of function that would have been provided by the standard Forest Practices Rules. The State and Services together developed a process to track forest practices in these bull trout areas of concern. The process was described in the [2009 Forest Practices HCP Annual Report](#) (DNR 2009).

There were no Forest Practices Applications associated with 20-Acre Exempt parcels in the bull trout areas of concern during the reporting period from July 1, 2012 through June 30, 2013.

6.7 20-Acre Exempt Forest Practices Application Data

Of the 5,133 Forest Practices Applications processed throughout the year, 4,854 were approved, and of those, 104 were new, approved 20-Acre Exempt applications adjacent to fish-bearing streams.

Number of 20-Acre Exempt Forest Practices Applications (July 2012 – June 2013)

20-Acre Exempt Forest Practices Applications with Specific Characteristics	Number
Number of 20-Acre Exempt applications with fish-bearing water	104
Number of 20-acre Exempt applications that were conversions with fish-bearing water	2
Number of 20-Acre Exempt applications with fish-bearing water that were not conversions	102
Number of 20-Acre exempt applications that were in Bull Trout Areas of Concern	0

Twenty-acre exempt non-conversion applications along fish-bearing water comprised about 2.1 percent of all approved applications submitted during the 2012-2013 reporting period. This percent was calculated with non-conversion 20-acre Forest Practices Applications because the Incidental Take Permits do not cover Forest Practices Applications that are conversions.