Northwest Fisheries Science Center Processed Report

Draft Economic Analysis of Critical Habitat Designation for 13 Pacific Salmon and O. mykiss ESUs

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Executive Summary

ES.1 Introduction

The National Marine Fisheries Service (NOAA Fisheries) is proposing to designate critical habitat for five species of Pacific salmon and O. mykiss (Onchorynchus spp.) listed under the Endangered Species Act (ESA). The designations will eventually address 20 Evolutionarily Significant Units (ESUs) of these species in the states of Washington, Oregon, Idaho, and California. Section 4(b)(2) of the ESA requires NOAA Fisheries to consider the economic and other impacts of designating a particular area as critical habitat. NOAA Fisheries may exclude an area from critical habitat if it determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless it also determines that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

Because Pacific salmon and O. mykiss migrate through a broad range of interconnected habitats, implementation of section 7 of the ESA has potentially large economic and other impacts. This report focuses on the economic costs of critical habitat designation. This focus does not mean that the beneficial and non-economic impacts of critical habitat designation have been overlooked and not incorporated into the designation process. NOAA Fisheries has chosen to express the benefits of designation in terms of the conservation value of designating a particular area as critical habitat. These benefits are gauged with a biological metric and are the subject of a separate report (NMFS 2004a). Other impacts are also covered in separate reports, including impacts on tribes in Washington, Oregon, and Idaho (NMFS 2004b, NMFS 2004e).

ES.2 Background

NOAA Fisheries is responsible for determining whether species, subspecies, or distinct population segments of Pacific salmon and O. mykiss (inclusive of anadromous steelhead and some populations of resident rainbow trout) are threatened or endangered, and which areas constitute critical habitat for them under the ESA (16 U.S.C. 1531 et seq). To be considered for ESA listing, a group of organisms must constitute a "species." Section 3 of ESA defines species as follows: "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." The agency has determined that a group of Pacific salmon or O. mykiss populations qualifies as a distinct population segment if it is substantially reproductively isolated and represents an important component in the evolutionary legacy of the biological species. A group of populations meeting these criteria is considered an "evolutionarily significant unit" (ESU) (56 FR 58612, November 20, 1991). In its ESA listing of determinations for Pacific salmon and O. mykiss, NOAA Fisheries has treated an ESU as a distinct population segment and to date has identified six species comprised of 52 ESUs in Washington, Oregon, Idaho and California. NOAA Fisheries has determined that resident rainbow trout and anadromous steelhead are part of the same ESU in certain areas (for further discussion see 69 FR 33102; June 14, 2004). In this report, "O. mykiss" ESUs refer to ESUs that include populations of both anadromous steelhead and resident rainbow trout.

Section 4(b)(2) of the ESA requires NOAA Fisheries to designate critical habitat for threatened and endangered species "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security and any other relevant impact, of specifying any particular area as critical habitat." This section grants the Secretary [of Commerce] discretion to exclude any area from critical habitat if he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat." The Secretary's discretion is limited, as he may not exclude areas if it "will result in the extinction of the species."

The ESA defines critical habitat under section 3(5)(A) as:

> (I) the specific areas within the geographical area occupied by the species, at the time it is listed . . ., on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed . . . upon a determination by the Secretary that such areas are essential for the conservation of the species.

Once critical habitat is designated, section 7 of the ESA requires federal agencies to ensure they do not fund, authorize or carry out any actions that will destroy or adversely modify that habitat. This requirement is in addition to the section 7 requirement that federal agencies ensure their actions do not jeopardize the continued existence of listed species.

On February 16, 2000, NOAA Fisheries published final critical habitat designations for 19 ESUs, thereby completing designations for all 25 ESUs listed at the time (65 FR 7764). The 19 designations included more than one hundred and fifty river subbasins in Washington, Oregon, Idaho, and California. Within each occupied subbasin, NOAA Fisheries designated as critical habitat those lakes and river reaches accessible to listed fish along with the associated riparian zone, except for reaches on Indian land. Areas considered inaccessible included areas above long-standing natural impassable barriers and areas above impassable dams, but not areas above ephemeral barriers such as failed culverts.

In considering the economic impact, NOAA Fisheries determined that the critical habitat designations would impose very little or no additional requirements on federal agencies beyond those already imposed by the listing of the species themselves. The ESA's prohibition against adversely modifying critical habitat applies only to federal agencies, which are also prohibited from jeopardizing the continued existence of listed species. NOAA Fisheries reasoned that since it was designating only occupied habitat, there would be few or no actions that adversely modified critical habitat that also did not jeopardize the continued existence of the species. Therefore, there would be no economic impact as a result of the designations (65 FR 7764, 7765, February 16, 2000).

The National Association of Homebuilders (NAHB) challenged the designations in District Court in Washington, D.C. as having inadequately considered the economic impacts of the critical habitat designations (National Ass'n of Homebuilders v. Evans, 2002 WL 1205743 No. 00-CV-2799

(D.D.C.). NAHB also challenged NOAA Fisheries' designation of Essential Fish Habitat (EFH) (Pacific Coast Salmon Fishery Management Plan, 2000). While the NAHB litigation was pending, the Court of Appeals for the 10th Circuit issued its decision in New Mexico Cattle Growers' Association v. U.S. Fish and Wildlife Service, 248 F.3d 1277 (10th Cir. 2001) (NMCA). In that case, the Court rejected the FWS approach to economic analysis, which was similar to the approach taken by NOAA Fisheries in the final rule designating critical habitat for 19 ESUs of West Coast salmon and O. mykiss. The Court ruled that "Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes." Subsequent to the 10th Circuit decision, NOAA Fisheries entered into and sought judicial approval of a consent decree resolving the NAHB litigation. That decree provided for the withdrawal of critical habitat designations for the 19 salmon and O. mykiss ESUs and dismissed NAHB's challenge to the EFH designations. The District Court approved the consent decree and vacated the critical habitat designations by Court order on April 30, 2002 (National Ass'n of Homebuilders v. Evans, 2002 WL 1205743 (D.D.C. 2002).

On September 3, 2003, the Pacific Coast Federation of Fishermen's Associations (PCFFA), Institute for Fisheries Resources, the Center for Biological Diversity, the Oregon Natural Resources Council, the Pacific Rivers Council, and the Environmental Protection Information Center (PCFFA et al., filed a complaint alleging NOAA Fisheries's failure to timely designate critical habitat for the 19 ESUs. NOAA Fisheries filed with the D.C. District Court an agreement resolving that litigation and establishing a schedule for designation of critical habitat.

On July 13, 2004, the D.C. District Court approved a First Amendment to the Consent Decree and Stipulated Order of Dismissal that NOAA Fisheries jointly filed with PCCFA et al. This amendment provides for a revised schedule for the submission of proposed and final rules designating critical habitat for the 20 ESUs to the Federal Register. For those ESUs that are included on the list of threatened and endangered species as of September 30, 2004, and which fall under the responsibility of the Northwest Regional office of NMFS, proposed rules must be submitted to the Federal Register for publication no later than September 30, 2004. For those of the 20 ESUs that are included on the list of threatened and endangered species as of November 30, 2004, and which fall under the responsibility of the Southwest Regional office, proposed rules must be submitted to the Federal Register for publication no later than November 30, 2004. For those of the 20 ESUs addressed in the proposed rules and included on the lists of threatened and endangered species as of June 15, 2005, final rules must be submitted to the Federal Register for publication no later than June 15, 2005. In a separate rulemaking the NMFS Southwest Region intends to address critical habitat for the remaining seven ESUs subject to the amended consent decree.

This proposed rule addresses the following 13 ESUs under the jurisdiction of the agency's Northwest Region: (1) Puget Sound chinook salmon; (2) Lower Columbia River chinook salmon; (3) Upper Willamette River chinook salmon; (4) Upper Columbia River spring-run chinook salmon; (5) Oregon Coast coho salmon; (6) Hood Canal summer-run chum salmon; (7) Columbia River chum salmon; (8) Ozette Lake sockeye salmon; (9) Upper Columbia River O. mykiss; (10) Snake River Basin O. mykiss; (11) Middle Columbia River O. mykiss; (12) Lower Columbia River O. mykiss; and (13) Upper Willamette River O. mykiss. In separate rulemaking NOAA Fisheries'

Southwest Region intends to address critical habitat for the remaining seven ESUs subject to the PCFFA et al. complaint.

ES.3 Framework for the Analysis

The process of designating critical habitat under the ESA includes analyzing the economic, national security, and other relevant impacts of the designation. The 4(b)(2) exclusion process is conducted for a "particular area," not for critical habitat as a whole. For that reason, the analysis should be conducted at a geographic scale that divides the area under consideration into smaller subareas. The statute does not specify the exact geographic scale of these subareas, nor does it dictate the form of the economic analysis and the nature of the impacts to be included in the analysis.

Economic analyses of regulatory actions commonly use a standard benefit-cost framework. For reasons discussed here and in NMFS (2004d), NOAA Fisheries has chosen a framework more akin to a cost-effectiveness one. Ideally, a cost-effectiveness analysis first involves quantifying benefits, for example, percent reduction in extinction risk, percent increase in productivity, or increase in numbers of fish. Given the state of the science, it would be difficult to quantify the benefits of critical habitat designation reliably. It is possible, however, to differentiate among habitat areas based on their relative contribution to conservation. For example, habitat areas can be rated as having a high, medium or low conservation value. Such a rating is based on best professional judgment.

The qualitative ordinal evaluations of conservation value can be combined with estimates of the economic costs of critical habitat designation in a framework that essentially adopts that of cost-effectiveness. Individual habitat areas can then be assessed using both their biological evaluation and economic cost, so that areas with high conservation value and lower economic cost have a higher priority for designation and areas with a low conservation value and higher economic cost have a higher priority for exclusion.

The economic analysis of the costs of critical habitat designation follows the standard approach to regulatory analysis: The regulation under consideration changes the state of the world and any resulting changes in economic activity are then attributed to the regulation. This approach has been called the “baseline approach.” It does not assume the world will remain unchanged in the absence of regulation. Instead, it projects a future course of the world as a baseline, one which may involve substantial changes in economic and other conditions. It then projects another course in which the regulation has taken effect. The impacts of the regulation are then analyzed in terms of the differences between the two courses. Changes that would exist in the absence of the regulation are included in the baseline, and so do not add to the regulation’s benefits or costs.

Applying this approach to the designation of critical habitat takes the following steps:

1. Identify the baseline of economic activity and the statues and regulations that constrain that activity in the absence of the critical habitat designation;
2. Identify the types of activities that are likely to be impacted by critical habitat designation;

3. Estimate the costs of modifications needed to bring the activity into compliance with the ESA's critical habitat provisions;
4. Project over space and time the occurrence of the activities and the likelihood they will in fact need to be modified; and
5. Aggregate the costs up to the watershed level.

In considering the first step of this framework, we note that the critical habitat areas under consideration for the 13 ESUs of Pacific salmon and O. mykiss cover over 25 million acres in Idaho, Oregon, and Washington. For this analysis, each ESU is analyzed separately. We have also aggregated many of the results for the 13 ESUs considered together. This involves more than just summing the results for each ESU because some watersheds are in more than one ESU. A simple sum would therefore double-count the results from such a watershed.

The 4(b)(2) process is applied not at the level of the designation as a whole, but at the level of a "particular area." We used standard watershed units, as mapped by the U.S. Geological Service, designated by fifth field hydrologic unit codes, or HUC5s, referred to below as "watersheds." We also considered a set of nearshore marine areas and include them in the analysis. Figure ES-1 shows the HUC5 watersheds and nearshore areas for all 13 ESUs combined.

Table ES-1 below lists the number of watersheds by state for each ESU. Tables ES-2 and ES-3 give other baseline information at the ESU level. These tables include all watersheds and nearshore areas considered for critical habitat designation, not just those proposed for designation.

Figure ES-1

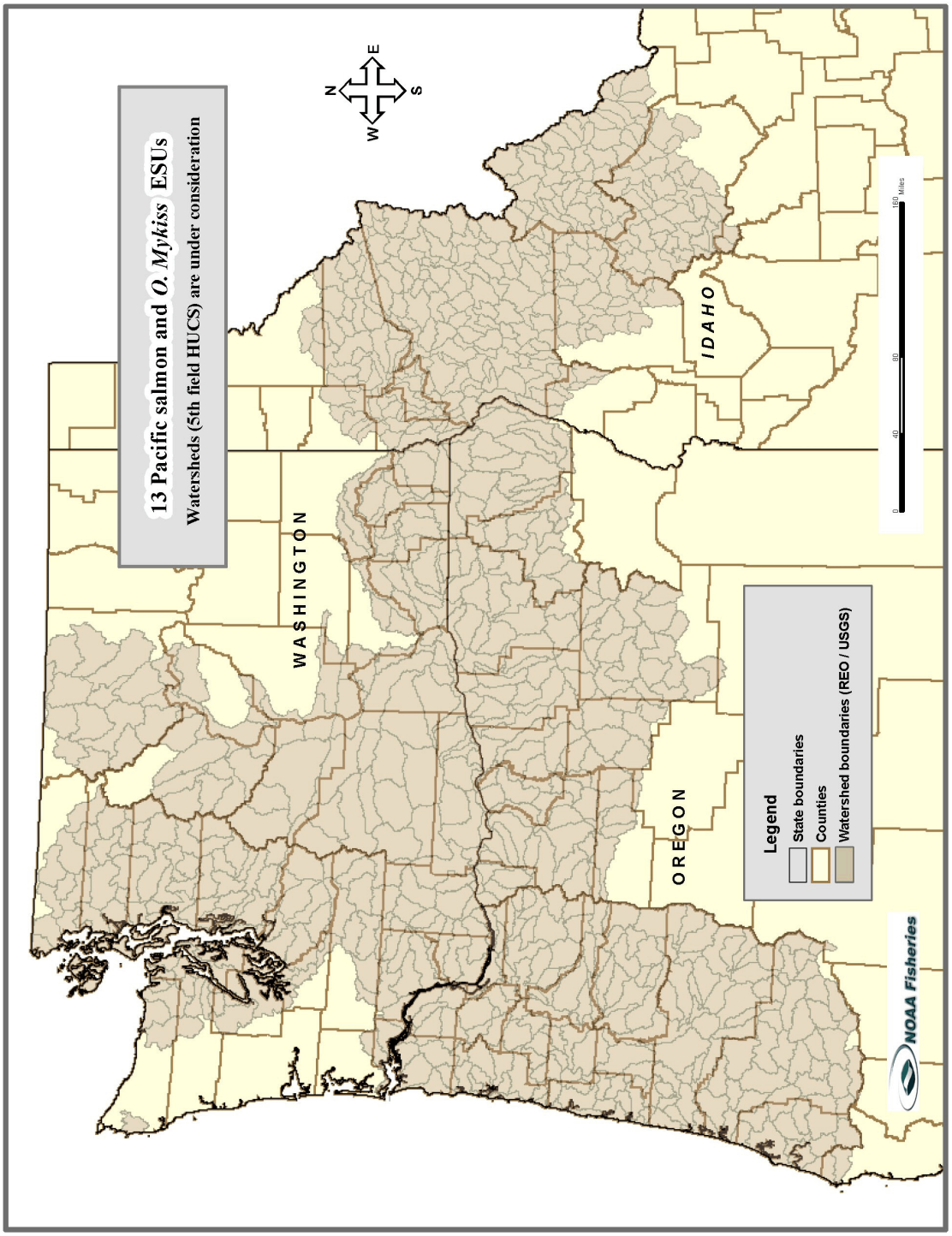
13 Pacific salmon and O. Mykiss ESUs
Watersheds (5th field HUCS) are under consideration
N
W
E
S
WASHINGTON
IDAHO
OREGON
Legend
State boundaries
Counties
Watershed boundaries (REO / USGS)
0
40
80
160 Miles
NOAA Fisheries

Table ES-1 Number of Watersheds by ESU and State				
ESU	**Idaho**	**Oregon**	**Washington**	**Total[1]**
Puget Sound chinook salmon[2]	0	0	80	80
Lower Columbia River chinook salmon	0	26	27	47
Upper Willamette River chinook salmon	0	58	0	58
Upper Columbia River chinook salmon	0	9	30	30
Oregon Coast coho salmon	0	80	0	80
Hood Canal summer-run chum salmon[3]	0	0	17	17
Columbia River chum salmon	0	7	18	19
Ozette Lake sockeye salmon	0	0	1	1
Upper Columbia River O. mykiss	0	9	41	41
Snake River Basin O. mykiss	287	0	0	287
Lower Columbia River O. mykiss	0	25	22	41
Upper Willamette River O. mykiss	0	36	0	36
Middle Columbia River O. mykiss	0	84	42	113

[1]The total number of watersheds may exceed the sum of the state totals because a watershed can span more than one state.
[2]The number of watersheds for the Puget Sound chinook salmon ESU includes 19 nearshore marine areas.
[2]The number of watersheds for the Hood Canal summer-run chum salmon ESU includes 5 nearshore marine areas.

Table ES-2
Demographics for Counties and ESUs

ESU	Population		Area (sq. miles)		Population Density	
	Counties	ESU	County	ESU	County	ESU
Puget Sound chinook salmon	4,147,091	3,438,663	23,395.0	11,036.6	177.3	311.6
Lower Columbia River chinook salmon	3,421,465	1,475,800	24,189.0	7,551.5	141.4	195.4
Upper Willamette River chinook salmon	2,525,484	1,791,854	19,207.0	9,561.8	131.5	187.4
Upper Columbia River chinook salmon	1,897,205	265,185	40,193.0	7,733.2	47.2	34.3
Oregon Coast coho salmon	1,583,067	266,690	23,666.0	10,442.3	66.9	25.5
Hood Canal summer-run chum salmon	371,852	79,425	4,910.0	1,461.3	75.7	54.4
Columbia River chum salmon	1,523,526	484,322	17,361.0	3,632.5	87.8	133.3
Ozette Lake sockeye salmon	64,525	85	1,739.0	101.0	37.1	0.8
Upper Columbia River O. mykiss	1,897,205	310,216	40,193.0	10,873.5	47.2	28.5
Snake River Basin O. mykiss	1,924,015	299,855	74,788.0	29,750.7	25.7	10.1
Lower Columbia River O. mykiss	3,361,027	1,384,659	22,165.0	6,576.3	151.6	210.6
Upper Willamette River O. mykiss	2,492,907	1,857,563	15,929.0	5,129.6	156.5	362.1
Middle Columbia River O. mykiss	3,978,171	617,838	55,023.0	24,602.9	72.3	25.1

Table ES-3 Income and Employment for Counties and ESUs				
	Personal Income ($1000)		Total Employment	
ESU	County	ESU	County	ESU
Puget Sound chinook salmon	$144,156,311	$125,615,440	2,647,033	2,280,554
Lower Columbia River chinook salmon	$98,292,588	$46,014,973	2,005,103	953,986
Upper Willamette River chinook salmon	$74,672,240	$52,491,827	$1,619,153	$1,158,596
Upper Columbia River chinook salmon	$51,900,062	$6,321,621	1,193,015	146,013
Oregon Coast coho salmon	$42,324,751	$6,135,714	890,001	141,751
Hood Canal summer-run chum salmon	$9,519,475	$2,042,304	175,667	37,873
Columbia River chum salmon	$43,587,334	$13,298,604	982,537	231,008
Ozette Lake sockeye salmon	$1,587,944	$2,092	31,902	42
Upper Columbia River O. mykiss	$51,900,062	$7,268,925	1,193,015	171,728
Snake River Basin O. mykiss	$52,970,906	$7,068,023	1,220,785	167,073
Lower Columbia River O. mykiss	$96,900,923	$43,827,919	1,971,507	907,579
Upper Willamette River O. mykiss	$74,088,949	$56,623,752	$1,594,024	$1,218,809
Middle Columbia River O. mykiss	$143,519,483	$14,192,698	2,841,365	329,049

For the second step, we examined the history of NOAA Fisheries consultations for the 13 ESUs of Pacific salmon and O. mykiss under consideration. Between 2001 and 2003, the NW region of NOAA Fisheries engaged in over 2100 consultations, involving 30 different Federal agencies. This consultation history provides a rich source of information on the types of activities that are likely to be affected by critical habitat designation.

From this consultation record, we derived the following set of activity types for the economic analysis:

- Hydropower dams[1]
- Non-hydropower dams and other water supply structures
- Federal lands management, including grazing (considered separately)
- Transportation projects
- Utility line projects
- Instream activities, including dredging (considered separately)
- EPA NPDES-permitted activities
- Sand & gravel mining
- Residential and commercial development

This set does not cover all possible activities but covers both the majority of consultations and a high proportion of the impacts. There are two important exceptions. In both cases, NOAA Fisheries continues to gather data on these exceptions and will present updated estimates prior to the final draft of the economic analysis.

The first exception is the impact of section 7 implementation on pesticide use. The Environmental Protection Agency (EPA) was recently enjoined from authorizing the application of a set of pesticides within a certain distance from "salmon supporting waters" (Washington Toxics Coalition, et al., v. EPA, C01-0132 (W.D. WA), 22 January 2004). The basis for this injunction was the EPA's failure to consult with NOAA Fisheries concerning possible adverse effects of pesticide application on ESA-protected salmon and O. mykiss. The effect of this injunction is to create an additional set of activities to be considered in the analysis, in that the restrictions on pesticide use can be viewed as a habitat-related impact of section 7. Because of the timing of the injunction, however, NOAA Fisheries does not yet have sufficient data to estimate these impacts at the watershed level. In Appendix H, we present preliminary estimates of the impacts at the ESU level, and for the designation of critical habitat for all ESUs as a whole.

The second exception is the impact of changes in the quantity and timing of water flow through dams and other water supply structures, including water withdrawals for irrigation purposes. The necessity, level, and method of flow changes to accommodate the biological needs of Pacific salmon

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1. The Federal Columbia River Power System (FCRPS) is a system of 31 federally-owned hydropower projects in the Columbia and Snake River basins. The impacts of critical habitat designation and implementation of section 7 of the ESA on the FCRPS are included in this analysis but treated as a separate type of hydropower activity.

and O. mykiss at a particular project are determined on a case by case basis, as is the economic impact associated with any flow change. For example, replacing power generated by peaking projects (i.e., projects that produce hydropower during periods of highest demand) is more expensive than replacing base power production. Until dam operations are reviewed on a case-by-case basis, the type and level of flow changes necessary and feasible for species and habitat protection is speculative, and so the data needed to estimate these impacts are not available. Because of this, the draft report does not include the economic impacts resulting from changes in flow regimes in the cost ranges associated with hydropower and non-hydropower projects.

Below, we summarize our cost estimates for each type of activity:

Hydropower Projects

Projects with installed capacity of less than 5MW: $2.1 million ($24,000 to $4.2 million).

Projects with installed capacity ranging from 5 to 20 MW: $5.76 million ($0 to $11.5 million).

Projects with installed capacity of greater than 20 MW that do not have but may require, fish passage facilities: $73.85 million ($11.5 million to $136 million).

Projects with installed capacity of greater than 20 MW that have, or will not require, fish passage facilities: $45.23 million ($11.5 million to $79.1 million).

Costs of dam removal: $24 million.

Dams with known/planned modification costs: varies.

Non-Hydropower Dams and Water Supply Structures

Infrastructure costs: $2.1 million ($24 thousand to $4.2 million).

Operation of Water Projects (e.g., flow regime, withdrawal constraints): Not quantified.

Federal Land Management Activities (excluding grazing)

Land management activities (excluding grazing): $0.68 to $8.71 per acre per year, depending on region.

Livestock Grazing on Federal Land

Livestock Grazing: $29.00 per acre per year ($11.00 to $48.00).

Transportation projects

Bridge and Culvert Projects: $41,778 to $98,278 per project (depends on project mileage).

Road Projects: $36,778 - 85,278 per project (range depends on project mileage).

Utility Line Projects

Outfall Structure and Pipelines: $101,000 ($100,000 to $102,000).

In-stream activities (excluding dredging)

Boat Dock, Boat Launch, Bank Stabilization: $54,500 ($25,000 to $84,000).

Dredging projects

Dredging: $821,000 ($332,000 to $1,300,000).

EPA NPDES-permitted Activities

Temperature Management Plan Compliance activities for Major Projects: $630,467 ($476,483 to $784,457).

Temperature Management Plan Compliance activities for Minor Projects: $72,039 ($0 to $144,078).

Sand and Gravel Mining

Sand and gravel mining: $676,532 ($0 to $1,353,065).

Residential and Commercial Development

Residential and Commercial Development: $235,000 ($230,000 to $240,000).

For the fourth step, we used spatial data on the location of projects for each activity type and estimated the annual volume of an activity type in a particular area. Where an activity has different sub-types or scales, a separate volume was estimated for each.

For each type of activity, we discuss in Appendix D the important assumptions that have the potential to introduce bias in our estimation, and the likely direction(s) of the bias(es). Table ES-4 below lists some of these assumptions.

Table ES-4
Major Assumptions and Potential Biases

Assumption	Direction of Potential Bias
For most types of activities, we count project modifications recommended in biological opinions as an impact of section 7 implementation, even if they appear to overlap particular baseline elements, such as fish passage provisions.	+
Costs associated with implementing past consultations are the most reasonable predictor of future costs.	+/-
The historic locations of USACE permits, stormwater permits, and other activities that have a Federal nexus are reasonable predictors of future locations of projects that will be impacted by section 7 implementation.	+/-
Hydropower and non-hydropower projects may be required to provide additional instream flow for salmon and O. mykiss and, as a result, may experience economic impacts to the extent that increased flow results in decreased or redistribution of power generation or other impacts. The likelihood of a particular project being required to provide flow for salmon and O. mykiss will depend on many factors, including biological significance of the dam project to salmon/O. mykiss survival and recovery, the seasonality of flow, the economic importance of the dam project, whether there is public concern over the project, and other factors. As a result, costs associated with flow requirements are not included in the cost estimates.	-
For Federal lands management activities, we assume that each acre of Federal land within critical habitat areas is subject to section 7 implementation. In fact, many projects may not affect salmon and O. mykiss habitat.	+

Table ES-4 Major Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
We assume that Federal land management agencies carry out land management activities consistently within geographical areas (e.g Cleveland and Sierra National Forests are assumed to conduct the same mix of activities because they fall within the Southern California region). Real variations in geography and management could result in different management activities in each management unit.	+/-
We assume that per-project costs of modifications to specific land management activities are uniform across geographic areas.	+/-
The long-term effects of modifying transportation projects in critical habitat areas on regional transportation functions (such as congestion and air pollution) are not included in this analysis. If projects occur that are not included in state transportation plans, this analysis may understate costs.	-
We assume that section 7 implementation will not result in any net reduction in utility transmission capability. The same amount of utility lines will be constructed, although potentially at a higher cost and/or in a different location.	-
This analysis assumes that substitute sites are unavailable to sand and gravel mining companies who are required to reduce mining efforts in salmon and O. mykiss critical habitat areas.	+
- : May result in an underestimate of real costs + : May result in an overestimate of real costs +/- : Has an unknown effect on estimates	

Finally, the fifth step consisted of calculating the economic impact of critical habitat designation for each watershed, using the following formula:

$$\text{Aggregate Annual Impact for Watershed (\$/yr)} = \text{Sum (over all Activity Types)} \left[\text{Activity Type Impact Volume} \times \text{Per-project Cost} \right]$$

We then used these results in two ways. First, the 4(b)(2) process used the annual impact for each watershed as a measure of the benefit of excluding that watershed from critical habitat designation. Second, we aggregated all the watershed-level impacts for each ESU to gauge the impacts at the

ESU level. Similarly, we aggregated all watersheds regardless of the ESU to gauge the impacts for the entire extent of the 13 critical habitat designations. This latter aggregation is not the same as summing the ESU-level impacts because a watershed can be in more than one ESU, and so a simple summation would double-count such a watershed.

ES.4 Economic Impacts of Critical Habitat Designation

Below, we present a series of tables that summarize the results of the analysis for the 13 Pacific salmon and O. mykiss ESUs. Table ES-5 gives the annual total impact and the present value of the impact over a 20 year period for each ESU. In this table and in Tables ES-7 and ES-8, the results are presented for six different cases, where we combine three cost estimate levels (Low, Midpoint, High) and two discount rates (7% and 3%). Table ES-6 gives the annual total impact and the present value of the impact over a 20 year period for each type of activity and for each ESU. Tables ES-7 and ES-8 list the average, median, maximum, and minimum annual total impact and present value of the impact over 20 years (respectively) for the individual watersheds in each ESU.

In assessing the overall cost of the 13 critical habitat designations, the figures given below for the individual ESUs cannot be added together to obtain an aggregate annual impact for all ESUs. Some watersheds are included in more than one ESU and so a simple summation would duplicate the impacts for these watersheds. We have therefore included in each table the aggregate impacts for all 13 ESUs. In all cases, we have included all watersheds considered in the 4(b)(2) process, whether or not they are proposed for exclusion.

Lastly, we emphasize that the impacts listed in these tables and many of the other tables in this report are those that stem from the implementation of section 7 for activities that modify habitat, and are not just the incremental impacts of critical habitat designation alone. As noted above and discussed later in the report, the NMCA decision called for an analysis of "all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes."[2] The estimates of impacts should then be interpreted as the sum of two types of impacts:

- Co-extensive impacts, or those that are associated with habitat-modifying actions covered by both the jeopardy and adverse modification standards; and
- Incremental impacts, or those that are solely attributable to critical habitat designation and would not occur without the designation.

2. New Mexico Cattle Growers' Association v. U.S. Fish and Wildlife Service, 248 F.3d 1277 (10th Cir. 2001).

Table ES-5 Annual Total Impact of Section 7 Implementation			
Discount Rate	**Cost Estimate**	**Annual Total Impact**	**Present Value over 20 years**
Puget Sound chinook salmon ESU			
7%	High	$134,244,435	$1,521,740,579
	Midpoint	$95,374,362	$1,081,125,167
	Low	$56,504,290	$640,509,755
3%	High	$129,578,898	$1,985,641,005
	Midpoint	$90,708,825	$1,390,003,819
	Low	$51,838,753	$794,366,632
Lower Columbia River chinook salmon ESU			
7%	High	$49,518,289	$561,319,278
	Midpoint	$35,077,449	$397,623,768
	Low	$20,636,610	$233,928,258
3%	High	$48,656,311	$745,599,528
	Midpoint	$34,215,471	$524,311,007
	Low	$19,774,632	$303,022,486
Upper Willamette River chinook salmon ESU			
7%	High	$42,644,380	$483,399,429
	Midpoint	$30,186,226	$342,178,841
	Low	$17,728,072	$200,958,252
3%	High	$40,720,112	$623,986,812
	Midpoint	$28,261,958	$433,080,567
	Low	$15,803,804	$242,174,321
Upper Columbia River spring-run chinook salmon ESU			
7%	High	$28,145,301	$319,043,740
	Midpoint	$18,362,959	$208,155,066
	Low	$8,580,616	$97,266,393
3%	High	$28,125,254	$430,985,748
	Midpoint	$18,342,912	$281,083,099
	Low	$8,560,570	$131,180,450
Oregon Coast coho salmon ESU			
7%	High	$28,464,568	$322,662,816
	Midpoint	$18,446,139	$209,097,966
	Low	$8,427,710	$95,533,115
3%	High	$28,435,930	$435,746,472
	Midpoint	$18,417,501	$282,226,085
	Low	$8,399,072	$128,705,699

Table ES-5 Annual Total Impact of Section 7 Implementation			
Discount Rate	**Cost Estimate**	**Annual Total Impact**	**Present Value over 20 years**
Hood Canal summer-run chum salmon ESU			
7%	High	$11,655,507	$132,122,108
	Midpoint	$7,624,320	$86,426,208
	Low	$3,593,134	$40,730,307
3%	High	$11,655,507	$178,606,645
	Midpoint	$7,624,320	$116,833,551
	Low	$3,593,134	$55,060,456
Columbia River chum salmon ESU			
7%	High	$21,301,109	$241,460,754
	Midpoint	$14,413,049	$163,380,490
	Low	$7,524,989	$85,300,226
3%	High	$20,630,258	$316,133,930
	Midpoint	$13,742,198	$210,582,676
	Low	$6,854,137	$105,031,423
Ozette Lake sockeye salmon ESU			
7%	High	$5,440	$61,666
	Midpoint	$2,720	$30,833
	Low	$0	$0
3%	High	$5,440	$83,361
	Midpoint	$2,720	$41,681
	Low	$0	$0
Upper Columbia River O. mykiss ESU			
7%	High	$46,675,540	$529,095,034
	Midpoint	$33,906,543	$384,350,843
	Low	$21,137,545	$239,606,652
3%	High	$45,666,986	$699,791,716
	Midpoint	$32,897,988	$504,122,159
	Low	$20,128,990	$308,452,602
Snake River Basin O. mykiss ESU			
7%	High	$56,438,758	$639,766,917
	Midpoint	$37,371,660	$423,630,014
	Low	$18,304,562	$207,493,111
3%	High	$56,410,120	$864,417,347
	Midpoint	$37,343,022	$572,236,971
	Low	$18,275,924	$280,056,595

Table ES-5 Annual Total Impact of Section 7 Implementation			
Discount Rate	**Cost Estimate**	**Annual Total Impact**	**Present Value over 20 years**
Lower Columbia River O. mykiss ESU			
7%	High	$38,662,458	$438,261,974
	Midpoint	$26,184,037	$296,811,643
	Low	$13,705,616	$155,361,313
3%	High	$37,142,694	$569,167,182
	Midpoint	$24,664,273	$377,950,365
	Low	$12,185,852	$186,733,547
Upper Willamette O. mykiss ESU			
7%	High	$18,115,971	$205,355,320
	Midpoint	$11,547,181	$130,894,169
	Low	$4,978,390	$56,433,019
3%	High	$17,963,213	$275,264,662
	Midpoint	$11,394,422	$174,605,835
	Low	$4,825,632	$73,947,009
Middle Columbia River O. mykiss ESU			
7%	High	$52,909,369	$599,759,193
	Midpoint	$35,021,657	$396,991,327
	Low	$17,133,945	$194,223,462
3%	High	$52,420,944	$803,288,010
	Midpoint	$34,533,231	$529,180,302
	Low	$16,645,519	$255,072,593
Aggregate Impacts for all ESUs			
7%	High	$383,312,627	$4,345,076,796
	Midpoint	$264,727,857	$3,000,847,841
	Low	$146,143,087	$1,656,618,885
3%	High	$374,065,180	$5,732,099,676
	Midpoint	$255,480,410	$3,914,930,482
	Low	$136,895,640	$2,097,761,289

Table ES-6 Annual Total Impact by Type of Activity			
Type of Activity	**Annual Total Impact**	**Present Value over 20 years**	**% of total**
Puget Sound chinook salmon ESU			
Hydropower Dams	$24,405,997	$276,656,502	25.6%
Non-hydropower Dams	$3,795,695	$43,026,462	4.0%
Federal Lands Management	$11,171,008	$126,630,023	11.7%
Grazing	$369	$4,185	0.0%
Transportation Projects	$1,372,053	$15,553,041	1.4%
Utility Line Projects	$2,020,000	$22,897,902	2.1%
Instream Activities	$37,891,125	$429,518,456	39.7%
Dredging	$12,725,500	$144,251,117	13.3%
EPA NPDES-permitted Activities	$1,199,074	$13,592,216	1.3%
Sand & Gravel Mining	$720,000	$8,161,629	0.8%
Residential & Commercial Development	$73,541	$833,633	0.1%
Lower Columbia River chinook salmon ESU			
Hydropower Dams	$8,436,850	$95,636,720	24.1%
Non-hydropower Dams	$1,579,773	$17,907,662	4.5%
Federal Lands Management	$8,880,814	$100,669,313	25.3%
Grazing	$450	$5,105	0.0%
Transportation Projects	$1,379,428	$15,636,642	3.9%
Utility Line Projects	$378,876	$4,294,788	1.1%
Instream Activities	$5,840,629	$66,207,003	16.7%
Dredging	$6,435,614	$72,951,513	18.3%
EPA NPDES-permitted Activities	$814,979	$9,238,275	2.3%
Sand & Gravel Mining	$1,146,667	$12,998,149	3.3%
Residential & Commercial Development	$183,369	$2,078,598	0.5%
Upper Willamette River chinook salmon ESU			
Hydropower Dams	$30,186,226	$342,178,841	50.7%
Non-hydropower Dams	$7,375,591	$83,606,718	12.4%
Federal Lands Management	$2,597,613	$29,445,484	4.4%
Grazing	$12,740,219	$144,417,961	21.4%
Transportation Projects	$653	$7,400	0.0%
Utility Line Projects	$690,802	$7,830,651	1.2%
Instream Activities	$746,667	$8,463,911	1.3%
Dredging	$145,515	$1,649,499	0.2%
EPA NPDES-permitted Activities	$315,176	$3,572,713	0.5%
Sand & Gravel Mining	$573,049	$6,495,849	1.0%
Residential & Commercial Development	$4,110,131	$46,590,784	6.9%

Table ES-6 Annual Total Impact by Type of Activity			
Type of Activity	**Annual Total Impact**	**Present Value over 20 years**	**% of total**
Upper Columbia River Spring-run chinook salmon ESU			
Hydropower Dams	$63,615	$721,114	0.3%
Non-hydropower Dams	$986,033	$11,177,265	5.4%
Federal Lands Management	$9,909,592	$112,331,127	54.0%
Grazing	$483	$5,474	0.0%
Transportation Projects	$424,585	$4,812,922	2.3%
Utility Line Projects	$328,376	$3,722,340	1.8%
Instream Activities	$4,346,375	$49,268,748	23.7%
Dredging	$1,505,509	$17,065,838	8.2%
EPA NPDES-permitted Activities	$283,665	$3,215,515	1.5%
Sand & Gravel Mining	$506,667	$5,743,368	2.8%
Residential & Commercial Development	$8,059	$91,355	0.0%
Oregon Coast coho salmon ESU			
Hydropower Dams	$84,820	$961,485	0.5%
Non-hydropower Dams	$1,293,505	$14,662,649	7.0%
Federal Lands Management	$13,877,810	$157,313,240	75.2%
Grazing	$788	$8,935	0.0%
Transportation Projects	$330,235	$3,743,411	1.8%
Utility Line Projects	$235,961	$2,674,761	1.3%
Instream Activities	$213,708	$2,422,509	1.2%
Dredging	$548,018	$6,212,105	3.0%
EPA NPDES-permitted Activities	$365,019	$4,137,708	2.0%
Sand & Gravel Mining	$1,413,333	$16,020,975	7.7%
Residential & Commercial Development	$82,941	$940,188	0.4%
Hood Canal Summer-run chum salmon ESU			
Hydropower Dams	$525,490	$5,956,745	6.9%
Non-hydropower Dams	$402,895	$4,567,055	5.3%
Federal Lands Management	$1,692,198	$19,182,075	22.2%
Grazing	$0	$0	0.0%
Transportation Projects	$39,900	$452,287	0.5%
Utility Line Projects	$75,750	$858,671	1.0%
Instream Activities	$3,229,125	$36,604,054	42.4%
Dredging	$1,436,750	$16,286,416	18.8%
EPA NPDES-permitted Activities	$87,040	$986,650	1.1%
Sand & Gravel Mining	$133,333	$1,511,413	1.7%
Residential & Commercial Development	$1,839	$20,841	0.0%

Table ES-6 Annual Total Impact by Type of Activity			
Type of Activity	**Annual Total Impact**	**Present Value over 20 years**	**% of total**
Columbia River chum salmon ESU			
Hydropower Dams	$1,579,683	$17,906,650	11.0%
Non-hydropower Dams	$614,945	$6,970,768	4.3%
Federal Lands Management	$2,214,913	$25,107,357	15.4%
Grazing	$101	$1,150	0.0%
Transportation Projects	$815,893	$9,248,632	5.7%
Utility Line Projects	$227,250	$2,576,014	1.6%
Instream Activities	$5,341,000	$60,543,414	37.1%
Dredging	$2,873,500	$32,572,833	19.9%
EPA NPDES-permitted Activities	$329,659	$3,736,882	2.3%
Sand & Gravel Mining	$400,000	$4,534,238	2.8%
Residential & Commercial Development	$16,104	$182,553	0.1%
Ozette Lake sockeye salmon ESU			
Hydropower Dams	$0	$0	0.0%
Non-hydropower Dams	$0	$0	0.0%
Federal Lands Management	$0	$0	0.0%
Grazing	$0	$0	0.0%
Transportation Projects	$0	$0	0.0%
Utility Line Projects	$0	$0	0.0%
Instream Activities	$0	$0	0.0%
Dredging	$0	$0	0.0%
EPA NPDES-permitted Activities	$2,720	$30,833	100.0%
Sand & Gravel Mining	$0	$0	0.0%
Residential & Commercial Development	$0	$0	0.0%
Upper Columbia River O. mykiss ESU			
Hydropower Dams	$4,085,136	$46,307,447	15.6%
Non-hydropower Dams	$2,374,960	$26,921,585	9.1%
Federal Lands Management	$11,187,580	$126,817,873	42.7%
Grazing	$743	$8,421	0.0%
Transportation Projects	$450,856	$5,110,726	1.7%
Utility Line Projects	$353,626	$4,008,564	1.4%
Instream Activities	$5,014,000	$56,836,675	19.1%
Dredging	$1,710,759	$19,392,469	6.5%
EPA NPDES-permitted Activities	$304,065	$3,446,762	1.2%
Sand & Gravel Mining	$693,333	$7,859,346	2.6%
Residential & Commercial Development	$8,978	$101,775	0.0%

Table ES-6 Annual Total Impact by Type of Activity			
Type of Activity	**Annual Total Impact**	**Present Value over 20 years**	**% of total**
Snake River Basin O. mykiss ESU			
Hydropower Dams	$392,293	$4,446,869	1.0%
Non-hydropower Dams	$1,887,245	$21,393,045	5.0%
Federal Lands Management	$23,998,475	$272,037,001	63.9%
Grazing	$3,533	$40,050	0.0%
Transportation Projects	$687,992	$7,798,804	1.8%
Utility Line Projects	$513,585	$5,821,792	1.4%
Instream Activities	$5,541,764	$62,819,198	14.8%
Dredging	$3,763,259	$42,658,778	10.0%
EPA NPDES-permitted Activities	$351,419	$3,983,544	0.9%
Sand & Gravel Mining	$373,333	$4,231,956	1.0%
Residential & Commercial Development	$46,053	$522,039	0.1%
Lower Columbia River O. mykiss ESU			
Hydropower Dams	$9,776,668	$110,824,353	28.8%
Non-hydropower Dams	$1,410,133	$15,984,691	4.2%
Federal Lands Management	$10,121,029	$114,727,887	29.8%
Grazing	$382	$4,325	0.0%
Transportation Projects	$1,327,419	$15,047,081	3.9%
Utility Line Projects	$378,876	$4,294,788	1.1%
Instream Activities	$3,914,939	$44,378,168	11.5%
Dredging	$5,271,846	$59,759,515	15.5%
EPA NPDES-permitted Activities	$653,632	$7,409,306	1.9%
Sand & Gravel Mining	$880,000	$9,975,324	2.6%
Residential & Commercial Development	$171,619	$1,945,405	0.5%
Upper Willamette O. mykiss ESU			
Hydropower Dams	$421,769	$4,780,999	3.7%
Non-hydropower Dams	$2,025,078	$22,955,459	17.5%
Federal Lands Management	$1,850,688	$20,978,649	16.0%
Grazing	$734	$8,318	0.0%
Transportation Projects	$675,906	$7,661,797	5.9%
Utility Line Projects	$471,923	$5,349,522	4.1%
Instream Activities	$145,515	$1,649,499	1.3%
Dredging	$4,110,131	$46,590,784	35.6%
EPA NPDES-permitted Activities	$760,497	$8,620,688	6.6%
Sand & Gravel Mining	$720,000	$8,161,629	6.2%
Residential & Commercial Development	$364,941	$4,136,825	3.2%

Table ES-6 Annual Total Impact by Type of Activity			
Type of Activity	**Annual Total Impact**	**Present Value over 20 years**	**% of total**
Middle Columbia River O. mykiss ESU			
Hydropower Dams	$3,587,727	$40,669,018	9.7%
Non-hydropower Dams	$3,127,738	$35,454,766	8.5%
Federal Lands Management	$18,927,526	$214,554,778	51.3%
Grazing	$741	$8,396	0.0%
Transportation Projects	$918,174	$10,408,048	2.5%
Utility Line Projects	$633,270	$7,178,492	1.7%
Instream Activities	$3,463,611	$39,262,095	9.4%
Dredging	$5,092,253	$57,723,713	13.8%
EPA NPDES-permitted Activities	$580,333	$6,578,417	1.6%
Sand & Gravel Mining	$533,333	$6,045,651	1.4%
Residential & Commercial Development	$20,721	$234,890	0.1%
Aggregate Impacts for all ESUs			
Hydropower Dams	$45,721,642	$518,282,033	17.3%
Non-hydropower Dams	$16,020,378	$181,600,515	6.1%
Federal Lands Management	$98,571,676	$1,117,368,625	37.2%
Grazing	$7,116.4	$80,669	0.0%
Transportation Projects	$4,866,822	$55,168,324	1.8%
Utility Line Projects	$4,480,865	$50,793,272	1.7%
Instream Activities	$55,889,478	$633,540,495	21.1%
Dredging	$29,934,686	$339,327,487	11.3%
EPA NPDES-permitted Activities	$3,911,580	$44,340,087	1.5%
Sand & Gravel Mining	$4,613,333	$52,294,879	1.7%
Residential & Commercial Development	$710,281	$8,051,453	0.3%

Table ES-7 Annual Total Impacts for Individual Watersheds					
Discount Rate	**Cost Estimate**	**Annual Total Impact**			
		Average	**Median**	**Maximum**	**Minimum**
Puget Sound chinook salmon ESU					
7%	High	$1,678,055	$974,387	$23,371,294	$2,720
	Midpoint	$1,192,180	$637,788	$15,221,609	$1,360
	Low	$706,304	$307,874	$7,071,925	$0
3%	High	$1,619,736	$974,387	$23,371,294	$2,720
	Midpoint	$1,133,860	$636,356	$15,221,609	$1,360
	Low	$647,984	$306,442	$7,071,925	$0
Lower Columbia River chinook salmon ESU					
7%	High	$1,053,581	$720,828	$6,002,599	$53,573
	Midpoint	$746,329	$549,672	$3,918,463	$34,120
	Low	$439,077	$230,643	$2,981,652	$12,745
3%	High	$1,035,241	$642,528	$5,988,281	$53,573
	Midpoint	$727,989	$507,257	$3,904,144	$34,120
	Low	$420,737	$230,643	$2,413,913	$12,745
Upper Willamette River chinook salmon ESU					
7%	High	$735,248	$472,120	$5,339,487	$6,648
	Midpoint	$520,452	$287,441	$4,633,402	$4,019
	Low	$305,656	$133,976	$4,004,503	$1,389
3%	High	$702,071	$469,256	$5,325,168	$6,648
	Midpoint	$487,275	$286,009	$3,741,458	$4,019
	Low	$272,479	$133,976	$3,112,559	$1,389
Upper Columbia River spring-run chinook salmon ESU					
7%	High	$938,177	$766,800	$4,140,477	$36,845
	Midpoint	$612,099	$486,445	$2,611,595	$19,723
	Low	$286,021	$205,137	$1,082,713	$2,601
3%	High	$937,508	$763,936	$4,134,749	$36,845
	Midpoint	$611,430	$483,581	$2,605,867	$19,723
	Low	$285,352	$205,137	$1,076,986	$2,601
Oregon Coast coho salmon ESU					
7%	High	$355,807	$277,315	$1,082,401	$0
	Midpoint	$230,577	$183,839	$684,634	$0
	Low	$105,346	$82,152	$366,275	$0
3%	High	$355,449	$275,884	$1,070,946	$0
	Midpoint	$230,219	$182,407	$684,634	$0
	Low	$104,988	$82,152	$366,275	$0

Table ES-7 Annual Total Impacts for Individual Watersheds					
Discount Rate	**Cost Estimate**	**Annual Total Impact**			
		Average	**Median**	**Maximum**	**Minimum**
Hood Canal summer-run chum salmon ESU					
7%	High	$685,618	$413,853	$2,250,820	$120,194
	Midpoint	$448,489	$263,891	$1,452,160	$83,174
	Low	$211,361	$129,425	$746,109	$44,477
3%	High	$685,618	$413,853	$2,250,820	$120,194
	Midpoint	$448,489	$263,891	$1,452,160	$83,174
	Low	$211,361	$129,425	$746,109	$44,477
Columbia River chum salmon ESU					
7%	High	$1,121,111	$593,930	$6,002,599	$74,692
	Midpoint	$758,582	$374,003	$3,918,463	$50,552
	Low	$396,052	$171,547	$1,899,042	$12,745
3%	High	$1,085,803	$593,930	$5,988,281	$74,692
	Midpoint	$723,274	$371,139	$3,904,144	$50,552
	Low	$360,744	$171,547	$1,820,008	$12,745
Ozette Lake sockeye salmon ESU					
7%	High	$5,440	$5,440	$5,440	$5,440
	Midpoint	$2,720	$2,720	$2,720	$2,720
	Low	$0	$0	$0	$0
3%	High	$5,440	$5,440	$5,440	$5,440
	Midpoint	$2,720	$2,720	$2,720	$2,720
	Low	$0	$0	$0	$0
Upper Columbia River O. mykiss ESU					
7%	High	$942,987	$713,730	$5,004,532	$36,845
	Midpoint	$638,635	$472,951	$4,671,935	$19,723
	Low	$334,283	$164,396	$4,339,339	$2,601
3%	High	$905,919	$713,730	$4,134,749	$36,845
	Midpoint	$601,568	$472,951	$3,172,218	$19,723
	Low	$297,216	$164,396	$2,839,622	$2,601
Snake River Basin O. mykiss ESU					
7%	High	$198,031	$123,096	$1,870,604	$0
	Midpoint	$131,129	$83,800	$1,181,103	$0
	Low	$64,227	$42,845	$563,089	$0
3%	High	$197,930	$123,096	$1,870,604	$0
	Midpoint	$131,028	$83,800	$1,181,103	$0
	Low	$64,126	$41,988	$563,089	$0

Table ES-7 Annual Total Impacts for Individual Watersheds					
Discount Rate	**Cost Estimate**	**Annual Total Impact**			
		Average	**Median**	**Maximum**	**Minimum**
Lower Columbia River O. mykiss ESU					
7%	High	$1,138,428	$823,559	$6,002,599	$74,692
	Midpoint	$826,989	$574,269	$3,918,463	$50,552
	Low	$515,550	$278,681	$2,981,652	$26,412
3%	High	$1,113,829	$834,058	$5,988,281	$74,692
	Midpoint	$802,390	$557,390	$3,904,144	$50,552
	Low	$490,951	$275,817	$2,413,913	$26,412
Upper Willamette O. mykiss ESU					
7%	High	$503,221	$254,107	$5,339,487	$6,648
	Midpoint	$320,755	$161,358	$3,372,525	$4,019
	Low	$138,289	$61,148	$1,405,563	$1,389
3%	High	$498,978	$246,947	$5,325,168	$6,648
	Midpoint	$316,512	$161,358	$3,358,206	$4,019
	Low	$134,045	$61,148	$1,391,244	$1,389
Middle Columbia River O. mykiss ESU					
7%	High	$476,661	$290,882	$3,644,758	$201
	Midpoint	$315,510	$188,849	$2,266,329	$133
	Low	$154,360	$89,997	$1,542,991	$25
3%	High	$472,261	$290,882	$3,644,758	$201
	Midpoint	$311,110	$188,849	$2,155,444	$133
	Low	$149,960	$89,997	$1,208,767	$25
All 13 Pacific salmon and O. mykiss ESUs					
7%	High	$559,580	$248,827	$23,371,294	$0
	Midpoint	$386,464	$160,043	$15,221,609	$0
	Low	$213,348	$70,676	$7,071,925	$0
3%	High	$546,081	$244,231	$23,371,294	$0
	Midpoint	$372,964	$158,932	$15,221,609	$0
	Low	$199,848	$70,676	$7,071,925	$0

Table ES-8 Present Value of Annual Total Impact over 20 Years for Individual Watersheds					
Discount Rate	**Cost Estimate**	**Present Value over 20 years**			
		Average	**Median**	**Maximum**	**Minimum**
Puget Sound chinook salmon ESU					
7%	High	$19,021,757	$11,045,257	$264,927,525	$30,833
	Midpoint	$13,514,065	$7,229,703	$172,546,004	$15,416
	Low	$8,006,372	$3,489,933	$80,164,484	$0
3%	High	$24,820,513	$14,931,311	$358,137,008	$41,681
	Midpoint	$17,375,048	$9,751,388	$233,252,886	$20,840
	Low	$9,929,583	$4,695,855	$108,368,764	$0
Lower Columbia River chinook salmon ESU					
7%	High	$11,942,963	$8,171,012	$68,043,038	$607,280
	Midpoint	$8,460,080	$6,230,863	$44,418,113	$386,773
	Low	$4,977,197	$2,614,474	$33,798,795	$144,478
3%	High	$15,863,820	$9,845,966	$91,763,207	$820,940
	Midpoint	$11,155,553	$7,773,097	$59,826,322	$522,851
	Low	$6,447,287	$3,534,325	$36,990,321	$195,309
Upper Willamette River chinook salmon ESU					
7%	High	$8,334,473	$5,351,761	$60,526,268	$75,363
	Midpoint	$5,899,635	$3,258,317	$52,522,369	$45,555
	Low	$3,464,797	$1,518,694	$45,393,425	$15,747
3%	High	$10,758,393	$7,190,787	$81,601,811	$101,878
	Midpoint	$7,466,906	$4,382,749	$57,333,354	$61,582
	Low	$4,175,419	$2,053,017	$47,696,234	$21,287
Upper Columbia River spring-run chinook salmon ESU					
7%	High	$10,634,791	$8,692,131	$46,934,772	$417,664
	Midpoint	$6,938,502	$5,514,140	$29,603,985	$223,575
	Low	$3,242,213	$2,325,355	$12,273,198	$29,487
3%	High	$14,366,192	$11,706,401	$63,360,069	$564,610
	Midpoint	$9,369,437	$7,410,296	$39,931,790	$302,236
	Low	$4,372,682	$3,143,484	$16,503,510	$39,86
Oregon Coast coho salmon ESU					
7%	High	$4,033,285	$3,143,536	$12,269,658	$0
	Midpoint	$2,613,725	$2,083,926	$7,760,732	$0
	Low	$1,194,164	$931,244	$4,151,941	$0
3%	High	$5,446,831	$4,227,585	$16,410,956	$0
	Midpoint	$3,527,826	$2,795,172	$10,491,192	$0
	Low	$1,608,821	$1,258,884	$5,612,720	$0

Table ES-8 Present Value of Annual Total Impact over 20 Years for Individual Watersheds					
Discount Rate	**Cost Estimate**	**Present Value over 20 years**			
		Average	**Median**	**Maximum**	**Minimum**
Hood Canal summer-run chum salmon ESU					
7%	High	$7,771,889	$4,691,272	$25,514,384	$1,362,472
	Midpoint	$5,083,895	$2,991,361	$16,461,098	$942,830
	Low	$2,395,900	$1,467,113	$8,457,595	$504,176
3%	High	$10,506,273	$6,341,803	$34,491,114	$1,841,831
	Midpoint	$6,872,562	$4,043,812	$22,252,608	$1,274,546
	Low	$3,238,850	$1,983,288	$11,433,231	$681,560
Columbia River chum salmon ESU					
7%	High	$12,708,461	$6,732,550	$68,043,038	$846,676
	Midpoint	$8,598,973	$4,239,550	$44,418,113	$573,037
	Low	$4,489,486	$1,944,584	$21,526,766	$144,478
3%	High	$16,638,628	$9,101,264	$91,763,207	$1,144,562
	Midpoint	$11,083,299	$5,687,267	$59,826,322	$774,649
	Low	$5,527,970	$2,628,747	$27,889,436	$195,309
Ozette Lake sockeye salmon ESU					
7%	High	$61,666	$61,666	$61,666	$61,666
	Midpoint	$30,833	$30,833	$30,833	$30,833
	Low	$0	$0	$0	$0
3%	High	$83,361	$83,361	$83,361	$83,361
	Midpoint	$41,681	$41,681	$41,681	$41,681
	Low	$0	$0	$0	$0
Upper Columbia River O. mykiss ESU					
7%	High	$10,689,316	$8,090,554	$56,729,344	$417,664
	Midpoint	$7,239,308	$5,361,178	$52,959,166	$223,575
	Low	$3,789,300	$1,863,527	$49,188,989	$29,487
3%	High	$13,882,126	$10,937,055	$63,360,069	$564,610
	Midpoint	$9,218,302	$7,247,402	$48,610,431	$302,236
	Low	$4,554,477	$2,519,171	$43,513,791	$39,861
Snake River Basin O. mykiss ESU					
7%	High	$2,244,796	$1,395,371	$21,204,407	$0
	Midpoint	$1,486,421	$949,923	$13,388,507	$0
	Low	$728,046	$485,674	$6,382,953	$0
3%	High	$3,033,043	$1,886,305	$28,664,756	$0
	Midpoint	$2,007,849	$1,284,134	$18,098,987	$0
	Low	$982,655	$643,410	$8,628,668	$0

Table ES-8 Present Value of Annual Total Impact over 20 Years for Individual Watersheds					
Discount Rate	**Cost Estimate**	**Present Value over 20 years**			
		Average	**Median**	**Maximum**	**Minimum**
Lower Columbia River O. mykiss ESU					
7%	High	$12,904,757	$9,335,534	$68,043,038	$846,676
	Midpoint	$9,374,411	$6,509,686	$44,418,113	$573,037
	Low	$5,844,065	$3,159,011	$33,798,795	$299,399
3%	High	$17,068,091	$12,780,930	$91,763,207	$1,144,562
	Midpoint	$12,295,662	$8,541,335	$59,826,322	$774,649
	Low	$7,523,234	$4,226,562	$36,990,321	$404,736
Upper Willamette O. mykiss ESU					
7%	High	$5,704,314	$2,880,452	$60,526,268	$75,363
	Midpoint	$3,635,949	$1,829,091	$38,229,579	$45,555
	Low	$1,567,584	$693,145	$15,932,890	$15,747
3%	High	$7,646,241	$3,784,171	$81,601,811	$101,878
	Midpoint	$4,850,162	$2,472,620	$51,460,476	$61,582
	Low	$2,054,084	$937,015	$21,319,140	$21,287
Middle Columbia River O. mykiss ESU					
7%	High	$5,403,236	$3,297,323	$41,315,506	$2,282
	Midpoint	$3,576,498	$2,140,721	$25,690,193	$1,512
	Low	$1,749,761	$1,020,174	$17,490,722	$284
3%	High	$7,236,829	$4,457,421	$55,851,546	$3,085
	Midpoint	$4,767,390	$2,893,892	$33,029,598	$2,044
	Low	$2,297,951	$1,379,102	$18,522,901	$383
All 13 Pacific salmon and O. mykiss ESUs					
7%	High	$6,343,178	$2,820,599	$264,927,525	$0
	Midpoint	$4,380,800	$1,814,178	$172,546,004	$0
	Low	$2,418,422	$801,154	$80,164,484	$0
3%	High	$8,368,029	$3,742,553	$358,137,008	$0
	Midpoint	$5,715,227	$2,435,450	$233,252,886	$0
	Low	$3,062,425	$1,083,025	$108,368,764	$0

Section 1
Introduction and Background

1.1 Introduction

The National Marine Fisheries Service (NOAA Fisheries) is proposing to designate critical habitat for five species of Pacific salmon and steelhead (Onchorynchus spp.) listed under the Endangered Species Act (ESA). The designations will eventually address 20 Evolutionarily Significant Units (ESUs) of these species in the states of Washington, Oregon, Idaho, and California. Section 4(b)(2) of the ESA requires NOAA Fisheries to consider the economic and other impacts of designating a particular area as critical habitat. NOAA Fisheries may exclude an area from critical habitat if it determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless it also determines that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

This report analyzes the economic impacts of designating a particular area as critical habitat, based on the best scientific data available.[3] The report covers 13 ESUs in Washington, Oregon, and Idaho; 7 ESUs in California will be covered in a subsequent report. In this section, we give background information on the proposed designations and discuss the biology and habitat use of Pacific salmon and steelhead. The section finishes with an overview of the rest of the report.

1.2 Background

NOAA Fisheries is responsible for determining whether species, subspecies, or distinct population segments of Pacific salmon and O. mykiss (inclusive of anadromous steelhead and some populations of resident rainbow trout) are threatened or endangered, and which areas constitute critical habitat for them under the ESA (16 U.S.C. 1531 et seq). To be considered for ESA listing, a group of organisms must constitute a "species." Section 3 of ESA defines species as follows: "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." The agency has determined that a group of Pacific salmon or O. mykiss populations qualifies as a distinct population segment if it is substantially reproductively isolated and represents an important component in the evolutionary legacy of the biological species. A group of populations meeting these criteria is considered an "evolutionarily significant unit" (ESU) (56 FR 58612, November 20, 1991). In its ESA listing of determinations for Pacific salmon and O. mykiss, NOAA Fisheries has treated an ESU as a distinct population segment and to date has identified six species comprised of 52 ESUs in Washington, Oregon, Idaho and California. NOAA Fisheries has determined that resident rainbow trout and anadromous steelhead are part of the same ESU in certain areas (for further discussion see 69 FR 33102; June 14, 2004). The U.S. Fish and Wildlife Service (FWS) maintains jurisdiction over the rainbow trout components of these O. mykiss ESUs. In this report, "O. mykiss" ESUs refer to ESUs including populations of both anadromous steelhead and resident rainbow trout.

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3. The primary data for this report were gathered by Industrial Economics, Inc., which also prepared supplementary material for sections 3, 4, 5, and Appendices D and E of the report.

Section 4(b)(2) of the ESA requires NOAA Fisheries to designate critical habitat for threatened and endangered species "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security and any other relevant impact, of specifying any particular area as critical habitat." This section grants the Secretary [of Commerce] discretion to exclude any area from critical habitat if he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat." The Secretary's discretion is limited, as he may not exclude areas if it "will result in the extinction of the species."

The ESA defines critical habitat under section 3(5)(A) as:

> (I) the specific areas within the geographical area occupied by the species, at the time it is listed . . ., on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed . . . upon a determination by the Secretary that such areas are essential for the conservation of the species.

Once critical habitat is designated, section 7 of the ESA requires federal agencies to ensure they do not fund, authorize or carry out any actions that will destroy or adversely modify that habitat. This requirement is in addition to the section 7 requirement that federal agencies ensure their actions do not jeopardize the continued existence of listed species.

On February 16, 2000, NOAA Fisheries published final critical habitat designations for 19 ESUs, thereby completing designations for all 25 ESUs listed at the time (65 FR 7764). The 19 designations included more than one hundred and fifty river subbasins in Washington, Oregon, Idaho, and California. Within each occupied subbasin, NOAA Fisheries designated as critical habitat those lakes and river reaches accessible to listed fish along with the associated riparian zone, except for reaches on Indian land. Areas considered inaccessible included areas above long-standing natural impassable barriers and areas above impassable dams, but not areas above ephemeral barriers such as failed culverts.

In considering the economic impact, NOAA Fisheries determined that the critical habitat designations would impose very little or no additional requirements on federal agencies beyond those already imposed by the listing of the species themselves. The ESA's prohibition against adversely modifying critical habitat applies only to federal agencies, which are also prohibited from jeopardizing the continued existence of listed species. NOAA Fisheries reasoned that since it was designating only occupied habitat, there would be few or no actions that adversely modified critical habitat that also did not jeopardize the continued existence of the species. Therefore, there would be no economic impact as a result of the designations (65 FR 7764, 7765, February 16, 2000).

The National Association of Homebuilders (NAHB) challenged the designations in District Court in Washington, D.C. as having inadequately considered the economic impacts of the critical habitat

designations (National Ass'n of Homebuilders v. Evans, 2002 WL 1205743 No. 00-CV-2799 (D.D.C.). NAHB also challenged NOAA Fisheries' designation of Essential Fish Habitat (EFH) (Pacific Coast Salmon Fishery Management Plan 2000). While the NAHB litigation was pending, the Court of Appeals for the 10th Circuit issued its decision in New Mexico Cattle Growers' Association v. U.S. Fish and Wildlife Service, 248 F.3d 1277 (10th Cir. 2001) (NMCA). In that case, the Court rejected the FWS approach to economic analysis, which was similar to the approach taken by NOAA Fisheries in the final rule designating critical habitat for 19 ESUs of West Coast salmon and O. mykiss. The Court ruled that "Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes." Subsequent to the 10th Circuit decision, NOAA Fisheries entered into and sought judicial approval of a consent decree resolving the NAHB litigation. That decree provided for the withdrawal of critical habitat designations for the 19 salmon and O. mykiss ESUs and dismissed NAHB's challenge to the EFH designations. The District Court approved the consent decree and vacated the critical habitat designations by Court order on April 30, 2002 (National Ass'n of Homebuilders v. Evans, 2002 WL 1205743 (D.D.C. 2002).

On September 3, 2003, the Pacific Coast Federation of Fishermen's Associations (PCFFA), Institute for Fisheries Resources, the Center for Biological Diversity, the Oregon Natural Resources Council, the Pacific Rivers Council, and the Environmental Protection Information Center (PCFFA et al., filed a complaint alleging NOAA Fisheries's failure to timely designate critical habitat for the 19 ESUs. NOAA Fisheries filed with the D.C. District Court an agreement resolving that litigation and establishing a schedule for designation of critical habitat. The schedule provided for submission by June 30, 2004 to the Federal Register for publication the proposed rule(s) designating critical habitat for those of the 20 ESUs that are included on the list of threatened and endangered species as of June 30, 2004. The District Court approved the agreement on September 12, 2003.

This proposed rule addresses the following 13 ESUs under the jurisdiction of the agency's Northwest Region: (1) Puget Sound chinook salmon; (2) Lower Columbia River chinook salmon; (3) Upper Willamette River chinook salmon; (4) Upper Columbia River spring-run chinook salmon; (5) Oregon Coast coho salmon; (6) Hood Canal summer-run chum salmon; (7) Columbia River chum salmon; (8) Ozette Lake sockeye salmon; (9) Upper Columbia River O. mykiss; (10) Snake River Basin O. mykiss; (11) Middle Columbia River O. mykiss; (12) Lower Columbia River O. mykiss; and (13) Upper Willamette River O. mykiss. In separate rulemaking NOAA Fisheries' Southwest Region intends to address critical habitat for the remaining seven ESUs subject to the PCFFA et al. complaint.

1.3 Pacific Salmon and O. mykiss Biology and Habitat Use

Pacific salmon and O. mykiss are anadromous fish, meaning adults migrate from the ocean to spawn in freshwater lakes and streams where their offspring hatch and rear prior to migrating back to the ocean to forage until maturity. The migration and spawning times vary considerably between and within species and populations (Groot and Margolis 1991). At spawning, adults pair to lay and fertilize thousands of eggs in freshwater gravel nests or "redds" excavated by females. Depending on lake/stream temperatures, eggs incubate for several weeks to months before hatching as "alevins"

(a larval life stage dependent on food stored in a yolk sac). Following yolk sac absorption, alevins emerge from the gravel as young juveniles called "fry" and begin actively feeding. Depending on the species and location, juveniles may spend from a few hours to several years in freshwater areas before migrating to the ocean. The physiological and behavioral changes required for the transition to salt water result in a distinct "smolt" stage in most species. On their journey juveniles must migrate downstream through every riverine and estuarine corridor between their natal lake or stream and the ocean. For example, smolts from Idaho will travel as far as 900 miles from their inland spawning grounds. En route to the ocean the juveniles may spend from a few days to several weeks in the estuary, depending on the species. The highly productive estuarine environment is an important feeding and acclimation area for juveniles preparing to enter marine waters.

Juveniles and subadults typically spend from one to five years foraging over thousands of miles in the North Pacific Ocean before returning to spawn. Some species, such as coho and chinook salmon, have precocious life history types (primarily male fish) that mature and spawn after only several months in the ocean. Spawning migrations known as "runs" occur throughout the year, varying by species and location. Most adult fish return or "home" with great fidelity to spawn in their natal stream, although some do stray to non-natal streams. Salmon species die after spawning, while O. mykiss may return to the ocean and make repeat spawning migrations. This complex life cycle gives rise to complex habitat needs, particularly during the freshwater phase (see review by Spence et al. 1996). Spawning gravels must be of a certain size and free of sediment to allow successful incubation of the eggs. Eggs also require cool, clean, and well-oxygenated waters for proper development. Juveniles need abundant food sources, including insects, crustaceans, and other small fish. They need places to hide from predators (mostly birds and bigger fish), such as under logs, root wads and boulders in the stream, and beneath overhanging vegetation. They also need places to seek refuge from periodic high flows (side channels and off channel areas) and from warm summer water temperatures (coldwater springs and deep pools). Returning adults generally do not feed in fresh water but instead rely on limited energy stores to migrate, mature, and spawn. Like juveniles, they also require cool water and places to rest and hide from predators. During all life stages salmon and O. mykiss require cool water that is free of contaminants. They also require rearing and migration corridors with adequate passage conditions (water quality and quantity available at specific times) to allow access to the various habitats required to complete their life cycle.

The homing fidelity of salmon and O. mykiss has created a meta-population structure with distinct populations distributed among watersheds (McElhany et al. 2000). Low levels of straying result in regular genetic exchange among populations, creating genetic similarities among populations in adjacent watersheds. Maintenance of the meta-population structure requires a distribution of populations among watersheds where environmental risks (e.g., from landslides or floods) are likely to vary. It also requires migratory connections among the watersheds to allow for periodic genetic exchange and alternate spawning sites in the case that natal streams are inaccessible due to natural events such as a drought or landslide. More detailed information describing habitat and life history characteristics of the ESUs addressed in this rulemaking is described later in this notice.

1.4 Overview of Report

Because Pacific salmon and O. mykiss migrate through a broad range of interconnected habitats, implementation of section 7 of the ESA has potentially large economic and other impacts. This report covers some of these impacts, focusing on the economic costs of critical habitat designation. This focus does not mean that the beneficial and non-economic impacts of critical habitat designation have been overlooked and not incorporated into the designation process. As explained in Section 2 below, NOAA Fisheries has chosen to express the benefits of designation in terms of the conservation value of designating a particular area as critical habitat. These benefits are gauged with a biological metric and are the subject of a separate report (NMFS 2004a). Other impacts are also covered in separate reports, including impacts on tribes in Washington, Oregon, and Idaho (NMFS 2004b, NMFS 2004e).

Section 2 of this report outlines the framework for the economic analysis. In that section, we explain the 4(b)(2) process that NOAA Fisheries is using to consider particular areas for exclusion. We also explain how economic analysis fits into that process and outline the methods used to gauge the economic impacts. Section 3 describes the economic and legal conditions that account for the baseline of the analysis. This section includes socioeconomic descriptions of the areas covered by the proposed designations, as well as information on other laws and regulations that afford Pacific salmon and O. mykiss some level of habitat protection. Section 4 describes the types of activities affected by critical habitat designation and the costs of modifications needed to comply with section 7. In this part of the report, we also describe the methods used to project the occurrence of these activities over space and time. Finally, Section 5 presents a summary of the results of the analysis for each ESU. The report also contains a series of appendices that give the full set of results and greater details on other issues.

In most cases, we present the results of the analysis in two ways. First, the 4(b)(2) process is conducted at the level of a "particular area," which we have defined as a HUC5 watershed. The 4(b)(2) process therefore uses the annual impact of section 7 implementation for each watershed as a measure of the benefit of excluding that watershed from critical habitat designation. Second, we also present aggregated results at the ESU-level and for all ESUs combined. Regulatory determinations such as those imposed by the Regulatory Flexibility Act, E.O. 12866, and E.O. 13211 are conducted at the level of the regulation as a whole. The analysis supports these determinations by aggregating all the watershed-level impacts for each ESU to gauge the impacts at the ESU level. Similarly, we aggregated all watersheds regardless of the ESU to gauge the impacts for the entire extent of the 13 critical habitat designations. This latter aggregation is not the same as summing the ESU-level impacts because a watershed can be in more than one ESU, and so a simple summation would double-count such a watershed.

Section 2
Framework for the Economic Analysis

2.1 Introduction

The process of designating critical habitat under the ESA includes analyzing the economic, national security, and other relevant impacts of the designation. The 4(b)(2) exclusion process is conducted for a "particular area," not for critical habitat as a whole. For that reason, the analysis should be conducted at a geographic scale that divides the area under consideration into smaller subareas. The statute does not specify the exact geographic scale of these subareas, nor does it dictate the form of the economic analysis and the nature of the impacts to be included in the analysis.

In this section, we present the framework NOAA Fisheries is using to analyze the economic impacts of critical habitat designation. We begin by discussing this framework in broad terms. Economic analyses of regulatory actions commonly use a standard benefit-cost framework. For reasons discussed here and in NMFS 2004d, NOAA Fisheries has chosen a framework more akin to a cost-effectiveness one, and so we begin with a discussion of this issue from an economic standpoint. We then outline the 4(b)(2) process, which utilizes biological, economic, and other information. Finally, we discuss the framework for this economic analysis, which is designed to support the 4(b)(2) process.

2.2 General Analytical Framework

When an economic activity has biological effects or other consequences for conservation, analyzing those consequences can take a number of approaches. Two possible approaches are benefit-cost analysis and cost-effectiveness analysis. Each of these approaches has strong scientific support as well as support from the Office of Budget and Management through its guidelines on regulatory analysis (OMB 2003). Each also has well known drawbacks, both theoretical and practical. Below, we discuss them in the context of critical habitat designation.

2.2.1 Benefit-cost analysis

Benefit-cost analysis (BCA) is the first choice for analyzing the consequences of a regulatory action such as critical habitat designation (OMB 2003). BCA is a well-established procedure for assessing the "best" course or scale of action, where "best" is that course which maximizes net benefits (Zerbe and Dively 1994). Because BCA assesses the value of an activity in that way, however, it requires a single metric – most commonly dollars – be used to gauge both benefits and costs.

Although the data and economic models necessary to estimate costs may be difficult and/or costly to gather and develop, expressing costs in dollars is straightforward for most regulatory actions. This is the case for critical habitat designation, which has direct impacts on activities carried out, funded, or permitted by the federal government. In many instances, those activities must be

modified to comply with section 7 of the ESA. Assessing the cost of critical habitat designation and section 7 generally, then, is mainly a task of estimating the costs and volume of the modifications.[4]

The problem of assessing the benefits of critical habitat designation in a BCA framework is also straightforward in principle but much more difficult in practice. To the extent that ESA section 7 regulations increase the protections afforded Pacific salmon and O. mykiss habitat, they produce real benefits to those species. In principle, these benefits can be measured first by a biological metric, and then by a dollar metric. A biological metric could take the form of the expected decrease in extinction risk, increase in number of spawners, increase in the annual population growth rate, and so forth. A BCA would then use this metric to assess the state of the species with and without critical habitat designation. This assessment would reveal the biological impact of designation, quantified in terms of the metric.

Preserving Pacific salmon and O. mykiss has a well-established economic value.[5] Again, in principle, the quantified biological benefits could be evaluated in terms of willingness-to-pay, the standard economic measure of value for BCA (Zerbe and Dively 1994), and the measure recommended by OMB (OMB 2003). This would produce a dollar estimate of the benefits of critical habitat designation, which could then be compared directly to the costs. Evaluating a number of alternatives in this way would reveal the one with the highest net benefits (among those compared).

Translating biological benefits into dollar estimates of value is difficult and costly, however. NOAA Fisheries has used a variety of measures to gauge the viability of Pacific salmon and O. mykiss. No previous study has estimated the monetary value of these species using these measures, and so no economic data are available that would support a BCA of critical habitat designation.

2.2.2 Cost-effectiveness analysis

Recognizing the difficulty of estimating economic values in cases like this one, OMB has recently increased its emphasis on cost-effectiveness analysis (CEA) as an alternative to BCA:

> Cost-effectiveness analysis can provide a rigorous way to identify options that achieve the most effective use of the resources available without requiring monetization of all of [the] relevant benefits or costs. Generally, cost-effectiveness analysis is designed to compare a set of regulatory actions with the same primary outcome (e.g., an increase in the acres of wetlands protected) or multiple outcomes

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4. As noted in the economic analysis of critical habitat designation, there may be other types of costs, such as those generated by what are called "trigger" or "stigma" effects. While identifying and estimating the extent of these costs is difficult, the process is still straightforward. We discuss stigma effects in the context of residential and commercial development in Section 4.3.9 of this report.

5. See, for example, Olsen et al. (1991), Loomis (1996), and Layton et al. (1999).

that can be integrated into a single numerical index (e.g., units of health improvement).[6]

Ideally, CEA quantifies both the benefits and costs of a regulatory action but with different metrics. A common application of this method is to health care strategies, where the benefits of a strategy are quantified in terms of lives saved, additional years of survival, or some other health-related quantitative measure.[7]

Conducting a CEA of critical habitat designation would proceed along the same lines identified above for BCA, except that the last step of transforming biological benefits into economic (dollar) values would not be taken. Different configurations of critical habitat could be gauged by both metrics, with the cost-effectiveness ($ of cost/units of biological benefits) evaluated in each case. If alternatives have the same level of biological benefits, the most cost-effective is the one with the lowest ratio of $/biological benefits.

Standard CEA presumes that benefits can be measured with a cardinal[8] or even continuous measure. For critical habitat designation, however, constructing such a measure for the biological benefits is problematic. Although protecting habitat for Pacific salmon and O. mykiss has unquestionable benefits, it would be difficult to quantify the benefits reliably with a single biological metric given the state of the science (Beechie et al. 2003). There are models for estimating numbers of salmon that might be produced from a watershed under different sets of environmental conditions.[9] While such models give quantified results, the accuracy of the quantified projections is unknown because of data both on the relationships between environmental conditions and numbers of fish and the actual conditions of habitat in a given area are not available. This leads to a heavy reliance on expert opinion for estimating habitat condition and the expected response of fish to changing environmental conditions in a specific location. Moreover, applying such models at the scale required for Pacific salmon would be time-consuming and costly. Thus, applying CEA in its standard form is not possible.

An alternative form of CEA is one that develops an ordinal measure of the biological benefits of critical habitat designation. Although it is difficult to monetize or quantify benefits of critical habitat designation, it is possible to differentiate among habitat areas based on their relative contribution to conservation. For example, habitat areas can be rated as having a high, medium or low conservation value. Like the models discussed above, such a rating is based on best professional

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6. OMB (2003).

7. For a full discussion of CEA in this context, see Gold et al. (1996).

8. A cardinal measure has the important attribute of being susceptible to arithmetic operations. That is, if one object has a cardinal measure of "2", this can be compared directly to another object with a cardinal measure of "4", in that the second has "twice as much" of whatever is being measured as the first. Similarly, two objects with cardinal measure "2" would be equivalent to one object with a cardinal measure of "4".

9. For example, see Mobrand Biometrics, Inc. (1999).

judgment. The simpler output (a qualitative ordinal ranking), however, may better reflect the state of the science for the geographic scale considered here than a quantified output, and can be done more easily with available information. The qualitative ordinal evaluations can then be combined with estimates of the economic costs of critical habitat designation in a framework that essentially adopts that of cost-effectiveness. Individual habitat areas can be assessed using both their biological evaluation and economic cost, so that areas with high conservation value and lower economic cost have a higher priority for designation and areas with a low conservation value and higher economic cost have a higher priority for exclusion. By proceeding in order of these priorities (either in terms of inclusion or exclusion), a critical habitat designation will be formed in a manner that (in principle) minimizes or at least (in practice) reduces the overall economic cost of achieving any given level of conservation.

This form of CEA has two limitations, one of which it shares with the standard form of CEA. First, all CEAs have an important limitation when the level of benefits varies across alternatives. Because CEA does not evaluate benefits and costs in the same metric, the analysis cannot assess whether a given change has benefits that, in monetary terms, are greater than costs. Thus, while CEA is a way of minimizing the cost of achieving any given level of benefits, the analysis alone cannot specify which among a set of possible levels of benefits is the "best" choice.

A second limitation of the modified form of CEA is the inability to discern variation in benefits among those areas that have the same conservation value rank. A likely outcome is that using the modified CEA will lead to an outcome with higher expected costs of achieving any given level of conservation than one produced with standard CEA or BCA. This limitation should be compared to the greater feasibility of the modified CEA, however.

As is seen in the next part of this section, NOAA Fisheries has chosen a framework for its 4(b)(2) process that is similar to what is described as the modified form of CEA. This has implications for the economic analysis of critical habitat designation, which we outline following a discussion of the 4(b)(2) process.

2.3 Framework for the 4(b)(2) process

Specific areas that fall within the definition of critical habitat are not automatically designated as critical habitat. Section 4(b)(2) (16 U.S.C. 1533(b)(1)(A)) requires the Secretary to first consider the impact of designation and permits the Secretary to exclude areas from designation under certain circumstance. Exclusion is not required for any particular area:

> The Secretary shall designate critical habitat, and make revisions thereto, under subsection (a)(3) of this section on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial

data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

The approach NOAA Fisheries will take to implement section 4(b)(2) involves these steps:

1 Identify specific areas meeting the definition of critical habitat
2 Conduct a section 4(b)(2) analysis:
    2.1 Determine the benefit of designation;
    2.2 Determine the impact of designation;
    2.3 Determine whether benefits of exclusion outweigh benefits of designation
    2.4 Determine whether the exclusions will result in extinction of the species.

We review each of these steps below; the descriptions have been taken from [4(b)(2) report].

1. Identify specific areas meeting the definition of critical habitat
Areas that meet the definition of critical habitat include: 1) occupied areas that contain physical or biological features essential for conservation, which may require special management considerations or protection, and 2) unoccupied areas if the area itself is essential to conservation. In a separate draft report, NOAA Fisheries has documented its conclusions regarding which specific areas meet the definition of critical habitat and are therefore eligible for designation (NMFS 2004). Pursuant to section 3(5)(A), the first task was to determine "the geographical area occupied by the species at the time of listing." We developed extensive information regarding the stream reaches occupied by salmon and steelhead using data compiled by the fish and wildlife agencies of Oregon, Washington and Idaho, as the best available data. We collected and verified these data and produced distribution maps at a scale of 1:24,000, using standard Geographic Information System (GIS) software. We also developed latitude-longitude identifiers for the end-points of each occupied stream reach. We submitted these maps to the state agencies and to Indian tribes for verification.

Relying on the biology and life history of each species, we determined the physical or biological habitat features essential for their conservation. Again relying on the biology and population structure of the species, and on the characteristics of the habitat it occupies, we identified "specific areas" in which these physical or biological features could be found. To delineate specific areas, we used standard watershed units, as mapped by the U.S. Geological Service, designated by fifth field hydrologic unit codes, or HUC5s (this report refers to these HUC5s as "watersheds"). The USGS maps watershed as polygons, bounding a drainage area from ridge-top to ridge-top, encompassing streams, riparian areas and uplands. Within the boundaries of any watershed, there are stream reaches not occupied by the species. Land areas within the watershed boundaries are also generally not "occupied" by the species (though certain areas such as flood plains or side channels may be occupied at some times of some years). We used the watershed boundaries as a basis for aggregating occupied stream reaches, for purposes of delineating "specific" areas.

We used the same watershed aggregation of stream reaches to allow us to analyze the impacts of designating a "particular area," as required by section 4(b)(2). Section 3(5) defines critical habitat as being "specific areas" while section 4(b)(2) requires the agency to consider certain factors before

designating "particular areas." Depending on the biology of the species, the characteristics of its habitat, and the nature of the impacts of designation, "specific" areas might be different from, or the same as, "particular" areas. For this designation, we used the same delineation for both – the occupied stream reaches within a watershed – and refer to that delineation as a "habitat area."

Occupied estuarine and marine areas were also considered by the agency. Estuarine areas are crucial for juvenile salmonids given their multiple functions as areas for rearing/feeding, freshwater-saltwater acclimation, and migration (Simenstad et al. 1982, Marriott et al. 2002). In many areas, especially the Columbia River estuary, these habitats are occupied by multiple populations and ESUs. Nearshore areas also provide important habitat for rearing/feeding and migrating salmonids, and in Puget Sound support multiple populations of Puget Sound chinook and Hood Canal summer-run chum salmon (Beamish et al. 1998, WDFW and PNPTT 2000). As noted in previous rulemaking (65 FR 7764, February 16, 2000), the unique ecological setting of Puget Sound allowed the agency to focus on defining specific occupied marine areas.

NOAA Fisheries identified 19 nearshore marine zones in Puget Sound based on water resource inventory areas defined by the state of Washington (NMFS 2004a, WDFW 2003). The extent of the nearshore areas generally coincide with the maximum depth of the photic zone in Puget Sound (Mazer and Shepard 1962, Bakkala 1970, Mathews and Senn 1975, Fraser et al. 1978, Peterman 1978, Sakuramoto and Yamada 1980, Martin et al. 1986, Healey 1982, Bax 1983, Salo 1991 as cited in Johnson et al. 1997, Williams et al. 2003) and provide essential habitat important for juvenile salmonids and their prey (WDFW and PNPTT 2000).

2. Conduct a section 4(b)(2) analysis

Section 4(b)(2) provides that the Secretary shall consider certain impacts before designating critical habitat: "the Secretary shall designate critical habitat . . . on the basis of the best scientific data available and after taking into consideration the economic impact, impact to national security and any other relevant impact of specifying any particular area as critical habitat." In addition, section 4(b)(2) provides that the Secretary may exclude any area from critical habitat upon a determination that "the benefits of such exclusion outweigh the benefits of specifying such area as critical habitat." The balancing test in section 4(b)(2) contemplates weighing benefits that are not directly comparable – the benefit to species conservation balanced against the economic benefit, benefit to national security, or other relevant benefit that results if an area is excluded from designation. Section 4(b)(2) does not specify a method for the weighing process.

For the reasons noted in NMFS (2004d), NOAA Fisheries has adopted a 4(b)(2) process that takes the following steps:

2.1. Determine the benefit of designating each area as critical habitat

The principal benefit of designating critical habitat is that section 7 of the ESA requires every federal agency to ensure that any action it authorizes, funds or carries out is not likely to result in the destruction or adverse modification of critical habitat. This complements the section 7 provision that federal agencies ensure their actions are not likely to jeopardize the continued existence of a listed species. Another possible benefit is that the designation of critical habitat can serve to educate

the public regarding the potential conservation value of an area. This may focus and contribute to conservation efforts by clearly delineating areas of high conservation value for certain species.

After establishing those areas that meet the definition of critical habitat, NOAA Fisheries asked the teams of federal biologists to determine the relative conservation value of each area for each species (high, medium or low). This evaluation provided information necessary to determine the benefit of designating any particular habitat area as critical habitat in a manner that would aid the 4(b)(2) balancing test. The higher the conservation value of an area, the greater the benefit of sections 7's requirements that federal agency action not adversely modify the area.

The teams first scored each habitat area based on five factors related to the quantity and quality of the physical and biological features. They next considered each area in relation to other areas and with respect to the population occupying that area. Based on a consideration of the raw scores for each area, and a consideration of that area's contribution in relation to other areas and in relation to the overall population structure of the ESU, the teams rated each habitat area as having a "high," "medium" or "low" conservation value. The teams did not discount the conservation value of any specific area based on a presumption that the section 7 prohibition against jeopardy would protect the habitat regardless of whether it was designated as critical habitat.

Areas rated "high" are likely to contribute the most to conservation of an ESU, while those rated "low" are likely to contribute least. A rating of "high" carries with it a judgment that this area contributes significantly to conservation. A rating of "low" does not mean an area has no conservation value (and therefore there would be no benefit of designation), nor does it mean there would be no impact on conservation of the ESU if the habitat were adversely modified. The benefit of designating a habitat area with a low conservation value will depend on the reasons the area received a "low" rating, on the conservation value of other habitat areas available to the ESU, and on whether nearby habitat areas are designated.

As discussed earlier, the scale we chose for the "specific area" referred to in section 3(5)(a) was occupied stream reaches within a watershed, delineated by the USGS as a HUC5. (Throughout this report we refer to HUC5s as watersheds, and the occupied stream reaches within a watershed as habitat areas.) There were some complications with this delineation that required us to adapt the approach for some areas. In particular, a large stream or river might serve as a migration corridor to and from many watersheds, yet be imbedded itself in a watershed. In any given watershed through which it passes, the stream may have a few or several tributaries. For migration corridors embedded in a watershed, the teams of biologists rated the conservation value of the watershed based on the tributary habitat. We assigned the migration corridor the rating of the highest-rated watershed for which it served as a migration corridor. This could result in a migration corridor with a high rating embedded in a habitat area with a low or medium rating.

The reason for this treatment of migration corridors is the role they play in the salmon's life cycle. Salmon and steelhead are anadromous – born in fresh water, migrating to salt water to feed and grow, and returning to fresh water to spawn. Without a migration corridor to and from the sea, salmon cannot complete their life cycle. It would be illogical to consider a spawning and rearing

area as having a particular conservation value and not consider the associated migration corridor as having a similar conservation value.

2.2. Determine the impact of designation

The economic impacts of critical habitat designation are the subject of this report. Within the framework of the 4(b)(2) process, the analysis of economic impacts is limited to impacts that are not directly related to the conservation value of the particular area (and not among the "other relevant impacts" that are also being considered). In principle, the economic analysis would still cover both economic benefits of inclusion as well as economic benefits of exclusion. The designation of critical habitat may have ancillary benefits unrelated to Pacific salmon and O. mykiss. Data on such ancillary benefits of inclusion, however, are not available at the level of the particular areas that are the focus of the 4(b)(2) process. For that reason, the economic analysis focuses on the economic benefits of a particular area being excluded from critical designation, which we sometimes refer to as the economic costs of designation.

2.3. Determine whether benefits of exclusion outweigh benefits of designation

The next step is to examine areas that would be eligible for exclusion if the agency deems the economic impact to outweigh the benefit of designation. In determining whether the economic benefit of excluding a habitat area might outweigh the benefit to the species of designation, the agency will consider the following factors: 1) the policy goal of exercising its discretion to further conservation of listed species; 2) the policy goal of adopting regulations that minimize total economic impacts and disparate economic impacts; 3) the difficulty of balancing dissimilar values (dollars versus benefits to species conservation); and the limited time frame in which to make decisions. Consideration of these factors led the agency to adopt a cost-effectiveness approach (described above) in which the agency will give priority to excluding habitat areas with a relatively lower benefit of designation and a relatively higher economic impact.

The circumstances of most of the listed ESUs seem well suited to a cost-effectiveness approach. Pacific salmon and steelhead are wide-ranging species and occupy numerous habitat areas with thousands of stream miles. Most of these areas contain “physical or biological features” the agency has identified as “essential to conservation” of the ESUs. Not all these areas, however, are of equal importance to conserving an ESU, as evidenced by the biological teams’ rating of different areas as high, medium or low. In many cases it may therefore be possible to construct different scenarios for achieving conservation. Scenarios might have more or less certainty of achieving conservation, and more or less economic impact.

2.4. Determine whether the exclusions will result in the extinction of the species

In this final step, the agency will consider how exclusion of a particular area would affect the conservation of the ESU.

2.4 Framework for analyzing economic impacts of critical habitat designation

The economic analysis of the impacts of critical habitat designation follows the standard approach to regulatory analysis. The regulation under consideration changes the state of the world and any

resulting changes in economic activity are then attributed to the regulation. This approach has been called the "baseline approach."[10] It does not assume the world will remain unchanged in the absence of regulation. Instead, it projects a future course of the world as a baseline, one which may involve substantial changes in economic and other conditions. It then projects another course in which the regulation has taken effect. The impacts of the regulation are then analyzed in terms of the differences between the two courses. Changes that would exist in the absence of the regulation are included in the baseline, and so do not add to the regulation's benefits or costs.

Applying this approach to the designation of critical habitat takes the following steps:

1. Identify the baseline of economic activity and the statues and regulations that constrain that activity in the absence of the critical habitat designation;
2. Identify the types of activities that are likely to be impacted by critical habitat designation;
3. Estimate the costs of modifications needed to bring the activity into compliance with the ESA's critical habitat provisions;
4. Project over space and time the occurrence of the activities and the likelihood they will in fact need to be modified; and
5. Aggregate the costs up to the watershed level for each ESU.

In the remainder of this section, we briefly discuss each step in detail. The subsequent sections of the report provide the details of how the analysis was implemented and present the results of the analysis..

1. Identify the economic and statutory/regulatory baselines

The first part of identifying the baseline is to document the socioeconomic characteristics of the area covered by a critical habitat designation. Ideally, this part would include a projection of economic activity in this area over the time period under consideration. Adequate data are not available to make such projections, however, and so we present information on the region's current socioeconomic state.

The second part is to document existing legal and regulatory constraints on economic activity that are independent of critical habitat designation. In the case of critical habitat designation, the standard approach to regulatory analysis would describe a baseline that includes other forms of habitat protection, including those provided by other elements of the ESA. The NMCA decision, however, called this approach into question.[11] In that case, the Tenth Circuit Court of Appeals called for "a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes." Consistent with this decision, NOAA Fisheries will include the following in its analyses of the impacts of critical habitat designation:

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10. This methodology is fundamental to economic analysis and not peculiar to the analysis of critical habitat designations or other forms of regulations. See EPA (2000).

11. New Mexico Cattle Growers' Association v. U.S. Fish and Wildlife Service, 248 F.3d 1277 (10th Cir. 2001) (following quote).

- Co-extensive impacts, or those that are associated with habitat-modifying actions covered by both the jeopardy and adverse modification standards; and
- Incremental impacts, or those that are solely attributable to critical habitat designation and would not occur without the designation.

The economic impacts considered therefore include activities covered by the adverse modification standard of section 7 of the ESA, whether or not they are also covered by the jeopardy standard.

The laws and regulations that are considered for the baseline include the following:

- Overlapping and pre-existing CH designations;
- ESA protections for the 13 Pacific salmon and O. mykiss ESUs outside section 7;
- ESA protections for other listed species; and
- Other federal and state statutes and regulations.

In many cases, the protections afforded by these laws are intertwined with those of section 7. In cases where we cannot make a clear separation, we have adopted the stance that the impacts of habitat protection are attributed to the designation of critical habitat and the implementation of section 7.

2. Identify the types of activities likely impacted by critical habitat designation

Having specified the baseline economic conditions and legal/regulatory constraints, the next step is to identify the economic activity likely affected by critical habitat designation. Because section 7 directly applies only to federal actions, the majority of impacts will be borne by federal agencies, non-federal parties whose federally permitted activities are altered to avoid adverse modification, and those parties that are otherwise affected by the alteration of these activities. NOAA Fisheries maintains a substantial database covering consultations under section 7, and this database was used to derive a set of activity types for the analysis.

The designation of critical habitat may also trigger other impacts on non-federal activity, however. For example, state environmental laws may contain provisions that are triggered if a state-regulated activity occurs in federally-designated critical habitat. Another possibility is that critical habitat designation could have "stigma" effects, or impacts on the economic value of private land not attributable to any direct restrictions on the use of the land. All of these types of impacts are considered in the analysis, although quantitative estimates are not presented in every case.[12]

3. Estimate the costs of the necessary activity modifications

The next step in the analysis is to estimate the cost of modifying each type of activity to bring it into compliance with section 7. Where the federal agency's own project is the source of the potentially harmful effect, we assume sufficient expenditures are made to make the necessary modifications. Similarly, if the activity is one that is permitted or funded by a federal agency, we assume the non-

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12. We discuss stigma effects in the context of residential and commercial development in Section 4.3.9 of this report.

federal party does the same. This assumption is strong, in that there are alternatives to modifying the project and incurring those costs. The party responsible could pursue the activity in a location that does not potentially harm the species or choose not to pursue the activity at all.

Estimating costs also involves discounting. Modifications to activities that affect Pacific salmon and O. mykiss habitat may involve costs that are spread out over time. These costs must be discounted, using standard guidance in guides such as that from the Office of Management and Budget (OMB 2003). In accordance with the latest guidelines, we evaluate costs using both a 7% and a 3% discount rate.

As noted above, NOAA Fisheries is analyzing both the incremental and co-extensive impacts of critical habitat designation, in accord with the NMCA decision. It is still desirable, however, to separate the two types of costs. If an impact is co-extensive and not incremental, it will occur whether or not critical habitat is designated for a particular area. Weighing the benefits of inclusion against the benefits of exclusion, then, is most easily accomplished if the focus is on incremental impacts.

The simplest case for distinguishing incremental from non-incremental impacts is when incremental impacts are (approximately) a constant proportion of the total section 7 impacts. This was the approach taken , for example, in the Fish and Wildlife Service's economic analysis of critical habitat designation for the northern spotted owl, which focused on the effects of section 7 implementation on federal timber sales:

> It was further assumed, based on [Fish and Wildlife] Service consultative experience, that of the total reduction in [timber] sales, 70 percent would be due to listing impacts through application of the jeopardy standard and take prohibitions and the remaining 30 percent would be due to application of the adverse modification standard.[13]

The FWS made similar assumptions in the economic analyses for two other critical habitat designations (Brookshire et al. 1993 and Brookshire et al. 1995).

In the case at hand, however, examination of the consultation record for Pacific salmon and steelhead provides no guidance to distinguish incremental from co-extensive impacts in this way. Consultations that produce an outcome declaring adverse modification are exceptionally rare for these species. To see this, consider the consultation record, shown in Table 2-1, for three species of Snake River salmon (fall chinook, summer/spring chinook, and sockeye), which were listed and had critical habitat designated in the early 1990s.

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13. Schamberger et al. (1992), at 34.

Table 2-1 Consultations for Snake River (SR) ESUs			
	Number of Outcomes		
Outcome of Consultation	**SR fall chinook**	**SR summer/ spring chinook**	**SR sockeye**
Adverse modification, no jeopardy	1	1	1
Jeopardy, no adverse modification	0	2	0
Likely to adversely affect, but no jeopardy or adverse modification	87	114	75
No effect	1	3	1
Not likely to adversely affect	155	260	115
No response needed	22	65	21
Technical assistance provided	19	28	19

The absence in the consultation record of purely adverse modification judgments does not mean that critical habitat designation has no impact. Clearly, a decision to make a final determination of either adverse modification or jeopardy is very rare. This is expected if the federal agency undertaking the action anticipates what modifications may be needed and implements them prior to consultation. But the absence of such clear cases means that deducing the incremental impacts of critical habitat designation is difficult and is unlikely to produce the simple approach taken in previous analyses where a specific proportion is used.

Nevertheless, the consultation record for all Pacific salmon and O. mykiss does support, at least qualitatively, an assumption that the jeopardy standard and the adverse modification standard are applied for similar actions and in similar places. If critical habitat designation supplements the application of the jeopardy standard, then the correlation in when and where they are applied suggests that the incremental impacts are roughly proportional to the total (adverse modification + jeopardy) impacts.

If that is the case, providing information on total impacts provides useful information for the 4(b)(2) process, as long as the benefits of inclusion are judged in the same manner (that is, in terms of the total benefits of section 7, not just the incremental benefits of critical habitat protection). Both are biased upward, in that the true benefits of inclusion and of exclusion are less than the total benefits in each case. But if the incremental benefits and costs are roughly proportional to the total benefits and costs, respectively, it is still possible to ascertain, with a high likelihood, whether the benefits of inclusion are greater than the benefits of exclusion, even without knowledge of what that proportion may be.[14]

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14. Simply put, if $X > Y$, then $X/P > Y/P$ ($P>0$). Information on the relative sizes of total impacts thus provides useful information about the relative sizes of the incremental impacts even without

4. Project the occurrence of projects and likelihood of modification
The fourth step begins by projecting the occurrence over space and time of activities that are likely to be impacted by section 7 and critical habitat designation. Projecting the occurrence of projects is not the same as projecting the occurrence of consultations and concomitant modifications, however. We also consider the likelihood of a project triggering a consultation and requiring modifications. In some cases, we had relevant information on this likelihood for a specific project, while in most other cases we made assumptions about the distribution of that likelihood based on historical information or using best professional judgment.

5. Aggregate the costs for each watershed
Ideally, the estimation of the aggregate costs at the watershed level would focus on changes in consumer and producer surplus, the standard measure of regulatory impacts (EPA 2000, OMB 2003). This is in keeping with the guidance of the Office of Management and Budget and in accord with E.O. 12866 (OMB 2003).

Data to support such an analysis are not available, however, and the geographic scope of the designations also makes this approach impractical. A simpler approach provides an acceptable alternative under a robust set of circumstances. In cases where the scale of the activity being impacted in a watershed is "small," the aggregate costs of modifications approximates the change in economic surplus. A "small" scale is one that does not (significantly) affect the market for the goods and services associated with the type of project or action. With few exceptions, the projects and actions covered in this analysis appear to meet this standard.[15]

Our basic approach, then, is to estimate aggregate costs by using the per-project modification cost and the forecast volume of projects in a watershed to calculate a total cost for that activity and watershed. This method does not allow for more dynamic responses to section 7 (for example, relocating activities or changing their frequency or timing) nut will be a good approximation of the true impacts under most circumstances.

Our framework assumes that the per-project costs are not affected by the amount of critical habitat designated for an ESU (or across ESUs). This is in accord with the focus of the analysis on a single unit (a watershed), implicitly assuming that no other units have been designated. Yet as areas are in fact designated, economic impacts may accumulate and market-level effects may become significant. This may then affect the costs (and benefits) of additional inclusions. For example, if critical habitat designation restricts the supply of a good in more than one area, the magnitude of the restriction's impact on a particular area may depend on the amount of critical habitat designated overall.

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information on the factor of proportionality (that is, P).

15. The major exception is the Federal Columbia River Power System (FCRPS). This system of 31 hydropower dams on the Columbia River is treated as a separate type of activity because of its scale. The impacts of section 7 implementation on the FCRPS are considered at greater length in section 4.3.1, Appendix D (section D2.3), and Appendix G.

Another complication concerns the attribution of the impacts of critical habitat designation to an individual watershed. A large project may have biological effects that extend downstream, beyond the boundaries of the watershed within which it is located. If this is the case, the designation of a watershed other than the project's home watershed can nevertheless have impacts on that project. For example, a major hydropower project can have biological effects tens or even hundreds of miles downstream. Designating any one of the downstream watersheds would be sufficient to force at least some modifications on the project. The incremental impact of designating more than one downstream watershed would be significantly less than the incremental impact of designating the "first " watershed. This makes it difficult conceptually to attribute the impacts of designation to a particular area, as there is no basis for identifying one watershed among many as the "first" to be designated.

2.5 Summary

The economic framework we use in this report is a straightforward one, summing project-level impacts to estimate the total impact of designating a watershed as critical habitat. We have noted limitations in this framework, and more are considered for each activity in Section 4 below. Even with the limitations, the framework produces information that will allow the 4(b)(2) process to distinguish between areas that have a "high" benefit of exclusion and those that have a "low" benefit of exclusion. This information will support a cost-effectiveness approach to designating critical habitat.

Section 3
Baseline Information

3.1 Introduction

This section provides information on the economic, legal, and regulatory baselines for the economic analysis. The 13 Pacific salmon and O. mykiss ESUs cover parts of three states and intersects 12 counties in Idaho, 31 in Oregon, and 34 in Washington. These ESUs are protected by a complex web of other federal, state, and local laws and regulations. We begin with a brief overview of the geographic scope of the designations, and then discuss first the economic baseline and then the legal and regulatory baseline.

3.2 Geographic Scope of the Critical Habitat Designations

The critical habitat areas under consideration for the 13 ESUs of Pacific salmon and O. mykiss cover over 70 million acres in Idaho, Oregon, and Washington. Figures 1 to 14 (Map Appendix) show the HUC5 watersheds and nearshore areas for all 13 ESUs combined (Figure 1) and for each individual ESU (Figures 2 - 14). These watersheds and nearshore areas constitute the "particular areas" or the geographic units of analysis for this report. Table 3-1 below lists the number of watersheds by state for each ESU, while Table 3-2 lists the average and range of the watersheds size for each ESU. Appendix A lists the watersheds in each ESU and gives the watershed and subbasin names. We note here and consider in more detail later that a watershed may be considered for designation in more than one ESU.

As illustrated in these figures, the geographic scope of the critical habitat designations and the number of watersheds are quite large. For this reason, we discuss issues such as the baselines (see below) and the methods we used in the analysis (see Section 4 of the analysis) in the body of the report, but the bulk of the results of the economic analysis is presented in a series of appendices.

3.3 Economic Baseline

In presenting baseline information on the economic characteristics of the watersheds in the 13 ESUs, we face a classic problem: Ecological and economic boundaries do not coincide. Census information is available at the county (or metropolitan area) level, but a county may be covered by several watersheds, and this coverage varies widely, as Figures 2 through 14 illustrate. Describing economic activity at the level of the entire county may be misleading, however, as the watersheds considered for critical habitat designation may only cover a small part of the county. For example, nine counties in Oregon have less than five square miles in critical habitat areas being considered for one or more ESUs. Describing a baseline in terms of the socioeconomic characteristics of these counties would not be representative of the true baseline.

Table 3-1 Number of Watersheds by ESU and State				
ESU	**Idaho**	**Oregon**	**Washington**	**Total[1]**
Puget Sound chinook salmon[2]	0	0	80	80
Lower Columbia River chinook salmon	0	26	27	47
Upper Willamette River chinook salmon	0	58	0	58
Upper Columbia River chinook salmon	0	9	30	30
Oregon Coast coho salmon	0	80	0	80
Hood Canal summer-run chum salmon[3]	0	0	17	17
Columbia River chum salmon	0	7	18	19
Ozette Lake sockeye salmon	0	0	1	1
Upper Columbia River O. mykiss	0	9	41	41
Snake River Basin O. mykiss	287	0	0	287
Lower Columbia River O. mykiss	0	25	22	41
Upper Willamette River O. mykiss	0	36	0	36
Middle Columbia River O. mykiss	0	84	42	113

[1]The total number of watersheds may exceed the sum of the state totals because a watershed can span more than one state.
[2]The number of watersheds for the Puget Sound chinook salmon ESU includes 19 nearshore marine areas.
[3]The number of watersheds for the Hood Canal summer-run chum salmon ESU includes 5 nearshore marine areas.

One way to present a more accurate economic picture of the ESUs and their constituent watersheds is to apportion a county's economic activity between the part of the county that intersects the area being considered for an ESU's critical habitat designation and the part of the county that is not being considered. Using the percentage of the county area in each part would necessarily assume that the density of economic activity is uniform throughout a county, an assumption that is untenable. A strong but more palatable assumption is that economic activity is constant throughout a county on a per-capita basis. Estimating the population within a watershed then provides the basis for estimating economic activity at the watershed level. If the watersheds under consideration cover only part of a county, this approach also produces a more accurate picture of the potential impacts on that county.

Table 3-2 Watershed Size by ESU			
	Size of watershed (square miles)		
ESU	**Average**	**Maximum**	**Minimum**
Puget Sound chinook salmon[1]	180.8	338.1	69.9
Lower Columbia River chinook salmon	160.6	391.8	49.2
Upper Willamette River chinook salmon	164.8	411.2	53.3
Upper Columbia River chinook salmon	257.7	489.1	132.1
Oregon Coast coho salmon	130.5	308.2	16.7
Hood Canal summer-run chum salmon[1]	120.6	244.6	53.0
Columbia River chum salmon	191.2	391.8	116.4
Ozette Lake sockeye salmon[2]	101.0	---	---
Upper Columbia River O. mykiss	265.2	489.1	68.4
Snake River Basin O. mykiss	104.3	325.9	15.5
Lower Columbia River O. mykiss	160.4	274.3	53.4
Upper Willamette River O. mykiss	142.5	315.2	53.3
Middle Columbia River O. mykiss	220.1	849.8	58.4

[1]The statistics on size do not include the nearshore marine areas, which are typically much smaller than a watershed.
[2]The Ozette Lake sockeye salmon ESU consists of a single watershed.

Using spatial data on county and watershed boundaries and 2000 U.S. Census block data, we estimated the population of each watershed and of the part of each county covered by one or more watersheds in an ESU. Using the assumption of constant per-capita economic activity, we then estimated economic activity at the watershed level and for each county-ESU intersection. This was done by multiplying the value of per-capita economic activity by the estimated population in the watershed and in the county-ESU intersection.

Below, we present demographic and economic information in two ways: for the county as a whole and for the part of the county that intersects the watersheds in an ESU. Tables 3-3 and 3-4 summarize this information on an ESU-basis. In each case, we present a figure that sums over all the counties covered by an ESU by including the entire county, and then one that sums over all the

counties in an ESU by including only that portion covered by the ESU. Appendix B provides the same information for each county individually, while Appendix C provides this information (and more) at a watershed level, using the estimation procedure discussed above . We also estimated land ownership within watersheds and the portions of counties covered by the watersheds.

3.4 Statutory and Regulatory Baseline

There are two broad types of legal and regulatory restrictions that can protect habitat even in the absence of critical habitat designation. The first is other parts of the ESA, including critical habitat designations for Pacific salmon and O. mykiss ESUs not covered by this proposal. The second is a law or regulation that protects habitat, whether or not that is its intent, and operates independently of the ESA. Both of these are discussed below.

3.4.1 ESA habitat protections other than Section 7

In the current state of the world, where critical habitat is not designated for the 13 ESUs, the ESA can still protect habitat in three ways:[1]

1. ESA sections other than section 7 for the 13 ESUs;
2. Existing critical habitat designations for other Pacific salmon and O. mykiss that pre-date this proposal; and
3. ESA protections for non-salmon and non-O. mykiss species where the habitat for those other species overlaps the habitat for the 13 ESUs and these protections provide ancillary benefits for Pacific salmon and O. mykiss.

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1. The threatened listing for Oregon Coast coho salmon was set aside in Alsea Valley Alliance v. Evans, 161 F.Supp.2d 1154 (D.Or.2001), appeals dismissed on jurisdictional grounds, Alsea Valley Alliance v. Department of Commerce, Nos. 01-36071 and 01-36154, 358 F.3d 1181 (9th Cir. Feb. 24, 2004). On June 14, 2004, NOAA Fisheries published proposed listing revisions for all 26 listed populations of West Coast salmon and steelhead, including Oregon Coho. 69 Fed. Reg. 33102 (June 14, 2004). The analysis of that ESU is still relevant, then, as NOAA Fisheries intends to reach a decision on critical habitat for Oregon Coast coho salmon should the ESU be listed. Until that decision is made, however, the baseline protections afforded by other elements of the ESA do not apply to Oregon Coast coho salmon.

Table 3-3
Demographics for Counties and ESUs

ESU	Population		Area (sq. miles)		Population Density	
	Counties	ESU	Counties	ESU	County	ESU
Puget Sound chinook salmon	4,147,091	3,438,663	23,395.0	11,036.6	177.3	311.6
Lower Columbia River chinook salmon	3,421,465	1,475,800	24,189.0	7,551.5	141.4	195.4
Upper Willamette River chinook salmon	2,525,484	1,791,854	19,207.0	9,561.8	131.5	187.4
Upper Columbia River chinook salmon	1,897,205	265,185	40,193.0	7,733.2	47.2	34.3
Oregon Coast coho salmon	1,583,067	266,690	23,666.0	10,442.3	66.9	25.5
Hood Canal summer-run chum salmon	371,852	79,425	4,910.0	1,461.3	75.7	54.4
Columbia River chum salmon	1,523,526	484,322	17,361.0	3,632.5	87.8	133.3
Ozette Lake sockeye salmon	64,525	85	1,739.0	101.0	37.1	0.8
Upper Columbia River O. mykiss	1,897,205	310,216	40,193.0	10,873.5	47.2	28.5
Snake River Basin O. mykiss	1,924,015	299,855	74,788.0	29,750.7	25.7	10.1
Lower Columbia River O. mykiss	3,361,027	1,384,659	22,165.0	6,576.3	151.6	210.6
Upper Willamette River O. mykiss	2,492,907	1,857,563	15,929.0	5,129.6	156.5	362.1
Middle Columbia River O. mykiss	3,978,171	617,838	55,023.0	24,602.9	72.3	25.1

Table 3-4
Income and Employment for Counties and ESUs

ESU	Personal Income ($1000)		Total Employment	
	Counties	ESU	Counties	ESU
Puget Sound chinook salmon	$144,156,311	$125,615,440	2,647,033	2,280,554
Lower Columbia River chinook salmon	$98,292,588	$46,014,973	2,005,103	953,986
Upper Willamette River chinook salmon	$74,672,240	$52,491,827	$1,619,153	$1,158,596
Upper Columbia River chinook salmon	$51,900,062	$6,321,621	1,193,015	146,013
Oregon Coast coho salmon	$42,324,751	$6,135,714	890,001	141,751
Hood Canal summer-run chum salmon	$9,519,475	$2,042,304	175,667	37,873
Columbia River chum salmon	$43,587,334	$13,298,604	982,537	231,008
Ozette Lake sockeye salmon	$1,587,944	$2,092	31,902	42
Upper Columbia River O. mykiss	$51,900,062	$7,268,925	1,193,015	171,728
Snake River Basin O. mykiss	$52,970,906	$7,068,023	1,220,785	167,073
Lower Columbia River O. mykiss	$96,900,923	$43,827,919	1,971,507	907,579
Upper Willamette River O. mykiss	$74,088,949	$56,623,752	$1,594,024	$1,218,809
Middle Columbia River O. mykiss	$143,519,483	$14,192,698	2,841,365	329,049

Absent section 7 protections, Pacific salmon and O. mykiss habitat may still be protected by other parts of the ESA. For example, section 9's prohibition against "take" can curtail economic activity in an area occupied by a listed species. If there is no federal nexus – the federal government does not carry out, fund, or issue a permit for the activity – section 7 does not apply but the species and its habitat are still protected. The impacts engendered by section 9 and sections of the ESA other than section 7 are therefore included in the baseline and not considered in the analysis.

Similarly, restrictions on federal activities that jeopardize a listed species in ways that avoid modifying habitat are also embedded in the baseline. For example, in the 13 ESUs under consideration, NOAA Fisheries has conducted dozens of consultations over the past few years for activities such as harvest and hatchery operations, which may harm the species but not by modifying its habitat. Although the ESA may have substantial impacts on these activities, they are not related to section 7's constraints on habitat modification, and so are included in the baseline and not considered in the analysis.

A more challenging example is hydropower operations. The operation of hydropower dams can adversely modify spawning, rearing, and migratory habitat, but it can also directly harm Pacific salmon and O. mykiss by increasing mortality as the fish pass through a dam's turbines. Modifications that address the first set of effects properly fall within the scope of the economic analysis, while modifications that address the second set of effects belong, in principal at least, in the baseline. Distinguishing the effects of hydropower operations in this way, however, is not possible with the data available, and so all hydropower modifications are included in the analysis. This may result in an overestimate of the impacts of critical habitat.

A second source of habitat protection under the ESA stems from the fact that individuals from different ESUs may occupy the same geographic area, so that protecting habitat for one ESU may conserve the habitat of another ESU. This presents two issues for the establishment of the baseline, depending on whether the overlap is between new and existing areas or between new critical habitat areas.

The first case is for an overlap between the proposed designations and existing designations for Pacific salmon ESUs that are not part of this proposal. The Snake River Basin O. mykiss ESU overlaps the existing Snake River Basin fall chinook, spring-summer chinook, and sockeye salmon ESUs, which are not under consideration in the current proposal. The agency has stated its intention to revisit the existing critical habitat designations for Snake River ESUs, if appropriate, following completion of related rulemaking (67 Fed. Reg. 6215, Feb. 11, 2002). Given the uncertainty that these designations will remain in place in their current configuration, we have chosen not to include them in the baseline. Moreover, because of the cost-effectiveness framework we have adopted, so long as we also do not count these designations as part of the baseline when we consider the benefit of designation for each ESU, we will still have an accurate picture of the benefits of designation relative to the benefits of exclusion.

Overlap also exists among the ESUs that are under consideration. The resolution of this issue is more complicated. Ideally, where critical habitat proposals overlap and afford similar (but not

necessarily identical) protections, the analysis should consider the designations jointly. When actions take place simultaneously, there is no way to assign economic effects individually unless there is a pre-ordained or some other logical order for the actions. If that is the case, an alternative is to analyze them sequentially: The effects of the "first" designation would be analyzed under an initial set of baseline conditions, and then any overlapping designations would be analyzed using a baseline that included the prior designation(s). This is not possible for the Pacific salmon and O. mykiss ESUs, however, as NOAA Fisheries is proposing to designate them as a package.

Because none of the 13 ESUs has critical habitat designated in the current state of the world, and because the probability exists (from the point of view of this analysis) that critical habitat in fact may not be designated for certain watersheds, we make the following assumption: Where two or more of the ESUs under consideration overlap in terms of proposed critical habitat, the protections afforded by designating critical habitat for one ESU are not included in the baseline for the analysis of the impacts of the other ESUs.

Finally, other species listed under the ESA may occupy the same geographic area as Pacific salmon and O. mykiss, and thereby afford some protection to the latter's habitat. The range of bull trout, for example, overlaps with several Pacific salmon and O. mykiss ESUs, as does the critical habitat for the northern spotted owl and marbled murrelet. To the extent that the ESA protections for these species provide ancillary benefits to Pacific salmon and O. mykiss, those benefits should be included in the baseline. In at least one case (the Northwest Forest Plan, discussed below), these benefits may be significant.

A fundamental problem in incorporating these benefits into the baseline, however, is that they depend on the status of a species other than Pacific salmon and O. mykiss. If the status of that species improves, critical habitat could be revised but not based on any consideration of the status of Pacific salmon and O. mykiss. For that reason, we do not consider these benefits generally to be part of the baseline.

3.4.2 Other laws and regulations that protect habitat

Federal laws other than the ESA, and state and local laws and regulations can protect Pacific salmon and O. mykiss habitat in the absence of critical habitat designation. While these protections may not be as strong as those under section 7, they should still be included in the baseline. In many cases, a law or regulation directly affects an activity that also has the potential to adversely modify Pacific salmon and O. mykiss habitat. In those cases, we incorporate the economic impacts of these other measures into the baseline, in that we do not consider them even if section 7 also covers them. In other cases where the link is less clear or direct, we adopt a conservative stance and assume that the effects of the law or regulations and those of critical habitat designation do not overlap.

Below, we discuss the major sources of legal and regulatory baseline protection and note how we incorporated their effects into the analytical baseline. The "baseline status" notation is as follows:

- **Baseline status: No** – We explicitly considered this regulation in terms of its potential to offer baseline protection to the species, and determined that the regulation should not be assigned baseline status because: (1) its provisions for the protection of Pacific salmon and O. mykiss habitat were historically reinforced through section 7 consultation, and therefore considered to be coextensive with section 7; or (2) while the regulation encouraged behavior to protect Pacific salmon and O. mykiss habitat, it did not explicitly require these protections by law.
- **Baseline status: Partial** Certain protections for the species and habitat provided by this regulation are considered baseline; other protections are not. Using the Clean Water Act as an example, compliance with current water quality standards are considered to be baseline protections for the species and habitat. In contrast, explicit consideration of Pacific salmon and O. mykiss associated with section 404 permitting, which requires a section 7 consultation, is considered to be a protection associated with the designation of critical habitat.
- **Baseline status: Yes** – The protections provided by this regulation to Pacific salmon and O. mykiss habitat are incorporated into the baseline, as the impacts would occur without section 7 consultation and therefore not included in our cost assessment.

We also list other laws and regulations that may constrain habitat-modifying federal actions but are unlikely to provide significant protection.

Clean Water Act **(33 U.S.C. 1251 et seq. 1987)**
Baseline status: Partial
The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States. It gives the Environmental Protection Agency (EPA) the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA also continued requirements to set water quality standards for all contaminants in surface waters.

According to the CWA, it is unlawful for any person to discharge a pollutant from a point source into navigable waters, unless a permit is obtained under its provisions; this requires issuance of Section 404 permits from the USACE. As part of pollution prevention activities, the USACE may limit activities in waterways through its 404 permitting process, independent of salmon concerns. These reductions in pollution may benefit Pacific salmon and O. mykiss.

Under the National Pollutant Discharge Elimination System (NPDES) program, EPA sets pollutant-specific limits on the point source discharges for major industries and provides permits to individual point sources that apply to these limits.

Under the water quality standards program, EPA, in collaboration with States, establishes water quality criteria to regulate ambient concentrations of pollutants in surface waters. Under section 401 of the CWA, all applicants for a Federal license or permit to conduct activity that may result in discharge to navigable waters are required to submit a State certification to the licensing or permitting agency.

This analysis considers NOAA Fisheries's recommended modifications (as described in biological opinions) to USACE permit applications to be a section 7 impact. To the extent that NOAA Fisheries recommendations overlap with USACE's planned actions under CWA, then this analysis may overstate the impact of section 7 impacts. In addition, it includes impacts related to water temperature control requirements implemented through the NPDES program. Other potential CWA protections that are not reinforced through section 7 (e.g., as project modifications in biological opinions) are considered baseline protections.

National Forest Management Act (16 USC §§ 1600-1614 1976)

Baseline status: Partial

This Act requires assessment of forest lands, development of a management program based on multiple-use, sustained-yield principles, and implementation of a resource management plan for each unit of the National Forest System. The Act may provide protection to Pacific salmon and O. mykiss within National Forests, primarily through its authorization of the Northwest Forest Plan (NWFP) and PACFISH. NWFP and PACFISH provide numerous protections for salmon species related to Federal lands management activities (The NWFP and PACFISH are discussed in more detail below).

As stated below, this analysis considers NOAA Fisheries recommended alterations (as described in biological opinions) to planned USFS and BLM actions in these areas to be a section 7 impact. To the extent that NOAA Fisheries recommendations overlap NWFP provisions, this analysis may overstate the impact of section 7 implementation for Pacific salmon and O. mykiss. NWFP-dictated protections that are not reinforced through section 7 are considered baseline protections (which is the basis for the partial baseline status of this law).

Northwest Forest Plan (1994)[2]

Baseline status: Partial

The Northwest Forest Plan defines Standards and Guidelines (S&Gs) for forest use throughout the 24 million acres of Federal lands in its planning area (the range of the Northern spotted owl). Specifically, the NWFP provides S&Gs for management of timber, roads, grazing, recreation, minerals, fire/fuels management, fish and wildlife management, general land management, riparian area management, watershed and habitat restoration, and research activities on USFS and BLM lands. To accomplish its goals, the NWFP defines seven land allocation categories, including "matrix lands," which are areas where the majority of timber is to be taken, and Riparian Reserves and Key Watersheds, where distances from rivers are set within which many activities are restricted. The Aquatic Conservation Strategy (ACS) component of the plan specifically provides for fishery habitat, protection, and restoration.

All Federal lands management activities in the NWFP planning area are affected by the Northwest Forest Plan. As a result, some projects that would have affected salmon habitat will not be proposed, and therefore will not be subject to section 7 implementation. These changes in projects are

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2. NOAA Fisheries and the Fish and Wildlife Service recently clarified their application of section 7 to the Northwest Forest Plan. See USFS and BLM (2004).

considered baseline and are not included as an impact of section 7 in this analysis. For section 7 consultations that do occur, they may include project modifications that would already have occurred under the NWFP. These modifications are nevertheless included in this analysis as section 7 impacts. As a result, this analysis may overstate the costs of section 7 implementation for Pacific salmon and O. mykiss.

PACFISH (Interim strategies for managing anadromous fish-producing watersheds) (1995)
Baseline status: Partial
For anadromous fish-producing watersheds on Federal lands in eastern Oregon, Washington, Idaho and Northern California that are not covered by the Northwest Forest Plan (NWFP), USFS and BLM adopted a management strategy to arrest the degradation and begin the restoration of anadromous fish protection. This strategy was intended to be in place only for 18-months, beginning in February of 1995, but continues to be implemented.

Like the NWFP, PACFISH provides guidelines for timber, roads, grazing, recreation, minerals, fire/fuels management, lands, riparian area, watershed and habitat restoration, and fisheries and wildlife restoration. Standards and guidelines under PACFISH are nearly identical to those in the NWFP.

Federal lands management activities in the NWFP planning area are affected by PACFISH. As a result, some projects that would have affected salmon habitat will not be proposed, and therefore will not be subject to section 7 implementation. These changes in projects are considered baseline and are not included as a cost of section 7 in this analysis. For section 7 consultations that do occur, they may include project modifications that would already have occurred under PACFISH. These modifications are nevertheless included in this analysis as section 7 impacts. As a result, this analysis may overstate the costs of section 7 implementation for Pacific salmon and O. mykiss.

Federal Power Act (16 U.S.C. § 800 1920, as amended)
Baseline status: No
The purpose of the Federal Power Act (FPA) was to establish a regulatory agency to oversee non-federal hydropower generation. The resulting Federal Energy Regulatory Commission (FERC), an independent Federal agency governing approximately 2,500 licenses for non-Federal hydropower facilities, has responsibility for national energy regulatory issues.

This Act may provide protection to Pacific salmon and O. mykiss habitat from hydropower activities. Section 10(j) of the Federal Power Act (FPA) was promulgated to ensure that FERC considers both power and non-power resources during the licensing process. More specifically, section 18 of the FPA states that FERC shall require the construction, operation, and maintenance by a licensee at its own expense of a fishway if prescribed by the Secretaries of Interior (delegated to the Fish and Wildlife Service) and Commerce (NOAA Fisheries).

The recommendation to install or improve a fish ladder may be brought about through consultation under section 7 of the ESA or through the FPA. In the absence of information on which regulation

may serve as the causative factor, this analysis considers the cost of these modifications as section 7 impacts.[3]

Northwest Electric Power Planning and Conservation Act (Northwest Power Act) (16 U.S.C. §§ 839-839h 1920, as amended)

Baseline status: Partial

This regulation provides for the protection, mitigation, and enhancement of fish and wildlife, including related spawning grounds and habitat, of the Columbia River and its tributaries. Hydropower activities in the Northwest Region are impacted through the Northwest Power Act's Fish and Wildlife Program directing the Pacific Northwest Electric Power and Conservation Council to adopt programs to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River system. This regulation has encouraged use of the Bonneville Power Administration's resources to mitigate and enhance fish and wildlife and habitat affected by the development and operation of hydroelectric projects in the Columbia River and its tributaries.

Through the Northwest Power Act, the Council is directed to consider recommendations from all stakeholders including Federal (including NOAA) and State agencies, tribes, and power customers in the region. Accordingly, it is difficult to determine whether modifications to hydropower activities in consideration of the Pacific salmon and O. mykiss are ultimately precipitated by compliance with the Northwest Power Act or recommendations of section 7 consultation of the Endangered Species Act. This analysis, therefore, considers most of the hydropower modifications covered by the Northwest Power Act to be section 7 impacts. This likely results in an overestimate of impacts to the hydropower industry of critical habitat designation.

Fish and Wildlife Coordination Act (16 U.S.C.§§ 661-666 1934, as amended)

Baseline status: No

This regulation provides that, whenever the waters or channels of a body of water are modified by a department or agency of the U.S., the department or agency first shall consult with the U.S. Fish and Wildlife Service and with the head of the agency exercising administration over the wildlife resources of the State where modification will occur with a view to the conservation of wildlife resources.

The purpose of this Act is to ensure that fish and wildlife resources are equally considered with other resources during the planning of water resources development projects by authorizing NOAA Fisheries to provide assistance to Federal and State agencies in protecting game species and studying

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3. This is a strong assumption, as there is evidence for particular dams that the application of the FPA alone has the ability to impose substantial modifications on FERC-licensed projects that benefit Pacific salmon and O. mykiss (Steve Fransen, NOAA Fisheries, personal communication). NOAA Fisheries has not yet considered this possibility comprehensively – that is, for every FERC-licensed project in each ESU. For that reason, in this draft analysis we have categorized modifications that may be attributable to the FPA as not being part of the baseline. As a result, this analysis may overstate the costs of section 7 implementation for Pacific salmon and O. mykiss.

the effects of pollution on wildlife. This Act may offer protection to Pacific salmon and O. mykiss habitat by requiring consultation concerning the species with NOAA Fisheries for all in-stream activities with a Federal nexus.

This analysis assumes that NOAA Fisheries's recommendations to Federal agencies through consultation under the FWCA are the same, or similar, to those provided through section 7 for Pacific salmon and O. mykiss. As a result, recommendations generated from FWCA are considered to be coextensive with section 7, and these costs are included in this analysis.

Rivers and Harbors Act (33 USC §§ 401 et seq. 1938)
Baseline status: Partial
The Rivers and Harbors Act (RHA) places Federal investigations and improvements of rivers, harbors and other waterways under the jurisdiction of the Department of the Army (USACE) and requires that all investigations and improvements include due regard for wildlife conservation.

This Act may provide protection to the Pacific salmon and O. mykiss from in-stream construction activities. Under sections 9 and 10 of the RHA, the USACE is authorized to regulate the construction of any structure or work within navigable water. This includes, for example, bridges and docks.

To the extent that NOAA Fisheries's recommendations through section 7 overlap USACE regulated provisions for Pacific salmon and O. mykiss according to the RHS, this analysis overstates the impact of section 7 implementation for Pacific salmon and O. mykiss. RHA protections that are not reinforced through section 7 (e.g., as project modifications in biological opinions) are considered baseline protections.

National Environmental Policy Act (42 USC §§ 4321-4345 1969)
Baseline status: No
The National Environmental Policy Act (NEPA) requires that all Federal agencies conduct a detailed environmental impact statement (EIS) in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.

The NEPA process may provide protection to the Pacific salmon and O. mykiss for all activities that have Federal involvement, if alternatives are considered and selected that are less harmful to salmon and its habitat than others. For this analysis, however, NEPA provisions are not considered as a baseline element.

Wilderness Act (16 USC §§ 1131-1136 1964)

Baseline status: Yes

The Wilderness Act established the National Wilderness Preservation System. With a few exceptions, no commercial enterprise or permanent road is allowed within a wilderness area. Temporary roads, motor vehicles, motorized equipment, landing of aircraft, structures and installations are only allowed for administration of the area. Measures may be taken to control fire, insects and disease. Prospecting for mineral or other resources, if carried on in a manner compatible with the preservation of wilderness, is allowed.

The Wilderness Act may offer protections to Pacific salmon and O. mykiss by limiting land disturbing activities in Wilderness Areas in National Forests. Human activity in wilderness areas is likely to be greatly reduced when compared to non-wilderness areas, which is likely to benefit salmon. As explained in the next section, we used Schedules of Planned Actions (SOPAs) from National Forests to determine expected activity levels in the future. To the extent that Wilderness Area designations have precluded human activity and plans for activity in critical habitat, then Wilderness Area impacts are incorporated into the baseline.

The Sikes Act Improvements Act (16 USC §670 1997)

Baseline status: N/A

The Sikes Improvement Act (SIA) requires military installations to prepare and implement an Integrated Natural Resources Management Plan (INRMP). The purpose of the INRMP is to provide for:

- the conservation and rehabilitation of natural resources on military installations;
- the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and
- subject to safety requirements and military security, public access to military installations to facilitate the use of the resources.

INRMPs developed in accordance with SAIA may provide protection to the Pacific salmon and O. mykiss habitat on military lands.

The recent National Defense Authorization Act for Fiscal Year 2004 (Public Law No. 108-136) amended the ESA, affecting areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(I) of the ESA (16 U.S.C. 1533(A)(3)) provides that: "The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation." The Act also added "national security" as an impact to be considered in the 4(b)(2) process.

NOAA Fisheries has contacted the Department of Defense for information on DOD INRMPs and the benefits they might afford Pacific salmon and O. mykiss, as well as the potential impacts on

national security of the designations. These two areas are considered in a separate report, and therefore any impacts from the Sikes Act are not considered in this analysis, but will play a role in the 4(b)(2) process.

Washington Department of Ecology Minimum Requirements for Stormwater Management Impact on Land Use Activities Within Salmon and O. mykiss Critical Habitat

Baseline status: No

This guidance document's implementation is not required except in the case of municipal stormwater systems that require a NPDES permit. Implementation may also be required by local zoning laws or as other permit requirements. The analysis examines requirements under this guidance plan to estimate the types of costs likely to be borne for section 7 consultation stormwater consultation requirements.

Other statutes and regulations that apply to land use activities

While the following statutes and regulations may apply to the land within an ESU, they are unlikely to provide significant baseline protection and are not considered in the analysis.

Fish and Wildlife Conservation Act (16 USC §§ 2901-2911 1980, as amended) – The FWCA encourages States to develop, revise and implement, in consultation with Federal, State, local and regional agencies, a plan for the conservation of fish and wildlife, particularly species indigenous to the state.

Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801-1882 1976, as amended) – This regulation requires identification of essential fish habitat in fishery management plans and consideration of actions to ensure the conservation and enhancement of habitat.

Fisheries Restoration and Irrigation Mitigation Act (16 USC § 777 2000) - The FRIMA directs the Secretary of Interior, in consultation with the heads of other appropriate agencies, to develop and implement projects to mitigate impacts to fisheries resulting from the construction and operation of water diversions by local government entities (including soil and water conservation districts) in the Pacific Ocean drainage area.

Water Resources Development Act (33 USC §§ 2201-2330 1986, as amended) - WRDA authorizes the construction or study of USACE projects and outlines environmental assessment and mitigation requirements.

Anadromous Fish Conservation Act (16 USC §§ 757 et seq. 1965) - The AFCA authorizes the Secretary of the Interior to enter into agreements with States and other non-Federal interests to conserve, develop and enhance the anadromous fish resources of the U.S.

Wild and Scenic Rivers Act (16 USC §§ 1271-1287 2001) - WSRA authorizes the creation of the National Wilderness Preservation System and prohibits extractive activities on specific lands.

North American Wetland Conservation Act (16 USC § 4401 et seq. 1989) - NAWCA encourages partnerships among public agencies and other interests to protect, enhance, restore and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife.

Federal Land Policy and Management Act (43 USC §§ 1701-1782 1976) – This Act requires the Bureau of Land Management to employ a land planning process that is based on multiple use and sustained yield principles

Executive Order 11988 and 11990 (1977) – These Executive Orders require, to the extent possible, prevention of long and short term adverse impacts associated with the occupancy and modification of floodplains and prevention of direct or indirect support of floodplain development wherever there is a practicable alternative.

Coastal Zone Management Act (16 USC §§ 1451 et seq. 1972) - CZMA establishes an extensive Federal grant program to encourage coastal States to develop and implement coastal zone management programs to provide for protection of natural resources, including wetlands, flood plains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat.

Section 4
The Impacts of Section 7 on Habitat-Modifying Activities

4.1 Introduction

In this section we present the estimated impacts of section 7 on an activity that may affect Pacific salmon and O. mykiss by modifying habitat. Section 5 presents estimates of aggregate impacts at the watershed level. Below, we first discuss the consultation history of the 13 Pacific salmon and O. mykiss ESUs. We then present the types of activities included in the analysis and the modifications typically needed to comply with section 7. For each type of activity, we then summarize the expected costs of these modifications and the methods we used to project the activity's occurrence over space and time. Appendix D gives a more detailed discussion of our methods for estimating impacts.

4.2 Consultation History

Since 1998, NOAA Fisheries has compiled an extensive history of section 7 consultations for the 13 ESUs of Pacific salmon and O. mykiss under consideration. Between 2001 and 2003, the NW region of NOAA Fisheries conducted over 2,100 consultations, involving 30 different Federal agencies, most notably the Army Corps of Engineers (1,021 consultations), Forest Service (315), Department of Transportation (266), and Bureau of Land Management (97). About 19% of the consultations were formal and about 68% were informal.[1] The remainder consisted of pre-consultation and technical assistance (11%), programmatic consultations[2] (1%), and emergency and other types of consultations (1%).

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1. A formal consultation involves the issuance of a biological opinion and incidental take statement by either of the Services. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required, except when the Services concur, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat. [50 CFR §402.02, 50 CFR §402.14]. An informal consultation is an optional process that includes all discussions and correspondence between the Services and a Federal agency or designated non-Federal representative, prior to formal consultation, to determine whether a proposed Federal action may affect listed species or critical habitat. This process allows the Federal agency to utilize the Services' expertise to evaluate the agency's assessment of potential effects or to suggest possible modifications to the proposed action which could avoid potentially adverse effects.

2. A programmatic consultation is a process where the required Section 7 consultation is conducted for certain types of work activities, rather than for the individual projects.

Tables 4-1 through 4-3 provide more detailed information on the consultation history. We first list the Federal agencies that have been most often involved in Pacific salmon and/or O. mykiss consultations within the Northwest region of NOAA Fisheries during 2001-2003, followed by a shorter list for each ESU. We then give the breakdown of consultations by type for each ESU.[3]

This consultation history provides a rich source of information on the types of activities that are likely to be affected by critical habitat designation.[4] Table 4-4 lists types that have been the subject of 75 or more consultation during 2001-2003, along with the number of consultations for that type of action.[5] The most common type of activity covered in the consultation record was breakwater, dock, or pier projects (627 consultations), followed by road construction or maintenance (578) and habitat restoration or improvement projects (487). Table 4-5 lists the five most common types of activities involved in salmon and/or O. mykiss consultations for each ESU during 2001-2003.

4.3 Types of Activities

From this consultation record, we derived the following set of activity types for the economic analysis:

- Hydropower dams
- Non-hydropower dams and other water supply structures
- Federal lands management, including grazing (considered separately)
- Transportation projects
- Utility line projects
- Instream activities, including dredging (considered separately)
- EPA NPDES-permitted activities
- Sand & gravel mining
- Residential and commercial development

This set does not cover all possible activities but covers both the majority of consultations and a high proportion of the impacts.[6] We discuss each of these types below.

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3. A single consultation can cover more than one ESU, so the sum of the columns in Table 4-3 is more than the total number of consultations for each type.

4. Consultations are not the only source of information, of course, because direct impacts through section 7 consultations are not the only source of critical habitat designation and section 7 impacts. Impacts from other laws or regulations may be triggered by the designation, or the designation may have so-called "stigma" effects. The section 7 consultation record will not provide information to document these types of impacts.

5. A single consultation can cover multiple types of activities.

6. The Environmental Protection Agency (EPA) was recently enjoined from authorizing the application of a set of pesticides within a certain distance from "salmon supporting waters" (Washington Toxics Coalition, et al., v. EPA, C01-0132 (W.D. WA), 22 January 2004). The basis for this injunction was the EPA's failure to consult with NOAA Fisheries concerning possible

Table 4-1 Federal Agencies involved in 10 or more Pacific salmon and O. mykiss consultations, NW Region, 2001-2003	
Federal Agency	**Number of Consultations**
Corps of Engineers	1021
US Department of Transportation	315
Forest Service	266
Bureau of Land Management	97
National Marine Fisheries Service	64
Department of Housing and Urban Development	57
Bonneville Power Administration	54
US Fish and Wildlife Service	51
Natural Resources Conservation Service	41
Bureau of Indian Affairs	38
Environmental Protection Agency	33
Bureau of Reclamation	29
Navy Department	23
Federal Transit Administration	14
Federal Energy Regulatory Commission	13
Rural Development Administration	12
Coast Guard	11
Federal Emergency Management Agency	10

adverse effects of pesticide application on ESA-protected salmon and O. mykiss. The effect of this injunction is to create an additional set of activities to be considered in the analysis, in that the restrictions on pesticide use can be viewed as a habitat-related impact of section 7. Because of the timing of the injunction, however, NOAA Fisheries does not yet have sufficient data to estimate these impacts at the watershed level. In Appendix H, we present preliminary estimates of the impacts at the ESU level, and for the designation of critical habitat for all ESUs as a whole.

Table 4-2
Federal Agencies involved in Pacific salmon and O. mykiss consultations, NW Region, 2001-2003

Puget Sound chinook salmon Corps of Engineers (619) US Department of Transportation (134) Forest Service (79) Housing and Urban Development (40) Environmental Protection Agency (25)	**Lower Columbia River chinook salmon** Corps of Engineers (144) US Department of Transportation (56) National Marine Fisheries Service (15) US Fish and Wildlife Service (15) Bonneville Power Administration (13)	**Upper Willamette River chinook salmon** Corps of Engineers (142) US Department of Transportation (38) Forest Service (36) Bureau of Land Management (18) US Fish and Wildlife Service (15)
Upper Columbia River chinook salmon Corps of Engineers (123) US Department of Transportation (43) Forest Service (36) US Fish and Wildlife Service (16) Bonneville Power Administration (12)	**Oregon Coast coho salmon** Corps of Engineers (110) Bureau of Land Management (66) US Department of Transportation (33) Forest Service (29) National Marine Fisheries Service (7)	**Hood Canal chum salmon** Corps of Engineers (46) Forest Service (16) US Department of Transportation (8) Navy Department (6) National Marine Fisheries Service (5)
Columbia River chum salmon Corps of Engineers (100) US Department of Transportation (28) US Fish and Wildlife Service (15) National Marine Fisheries Service (13) Bonneville Power Administration (9)	**Ozette Lake sockeye salmon** National Marine Fisheries Service (5) Corps of Engineers (1) Farm Service Agency (1) Federal Transit Administration (1) US Fish and Wildlife Service (1)	**Upper Columbia River O. mykiss** Corps of Engineers (129) US Department of Transportation (42) Forest Service (25) US Fish and Wildlife Service (19) National Marine Fisheries Service (18)

Table 4-2 Federal Agencies involved in Pacific salmon and O. mykiss consultations, NW Region, 2001-2003		
Snake River O. mykiss Corps of Engineers (162) Forest Service (124) US Department of Transportation (43) Bureau of Land Management (36) Bonneville Power Administration (29)	**Lower Columbia River O. mykiss** Corps of Engineers (142) US Department of Transportation (51) Forest Service (24) National Marine Fisheries Service (16) US Fish and Wildlife Service (16)	**Upper Willamette River O. mykiss** Corps of Engineers (128) US Department of Transportation (40) US Fish and Wildlife Service (15) Bureau of Land Management (12) Natural Resources Conservation Service (9)
Middle Columbia River O. mykiss Corps of Engineers (119) Forest Service (78) US Department of Transportation (54) Bonneville Power Administration (38) Bureau of Reclamation (27)		

Table 4-3 Pacific salmon and O. mykiss consultations by type and ESU, NW Region, 2001-2003							
	Formal		Informal		Program-matic		Grand Total
ESU	No.	%	No.	%	No.	%	
Puget Sound chinook salmon	43	4.3%	940	93.3%	7	0.7%	1008
Lower Columbia River chinook salmon	111	37.2%	139	46.6%	15	5.0%	298
Upper Willamette River chinook salmon	117	38.5%	113	37.2%	13	4.3%	304
Upper Columbia River chinook salmon	88	32.7%	145	53.9%	10	3.7%	269
Oregon Coast coho salmon	63	22.7%	122	44.0%	14	5.1%	277
Hood Canal summer-run chum salmon	11	11.7%	72	76.6%	5	5.3%	94
Columbia River chum salmon	63	31.0%	111	54.7%	15	7.4%	203
Ozette Lake sockeye salmon	4	44.4%	2	22.2%	3	33.3%	9
Upper Columbia River O. mykiss	99	35.5%	141	50.5%	9	3.2%	279
Snake River Basin O. mykiss	101	21.3%	270	57.0%	17	3.6%	474
Lower Columbia River O. mykiss	115	37.6%	129	42.2%	15	4.9%	306
Upper Willamette River O. mykiss	143	34.5%	201	48.4%	19	4.6%	415
Middle Columbia River O. mykiss	96	38.4%	96	38.4%	13	5.2%	250
All Pacific salmon and O. mykiss consultations*	**416**	**19.2%**	**1479**	**68.1%**	**25**	**1.2%**	**2171**

*A single consultation can cover more than one ESU, so the sum of the columns in Table 4-3 is more than the total number of consultations for each type.

Table 4-4 Actions involved in Pacific salmon and O. mykiss consultations, NW Region, 2001-2003	
Type of Action	**No. of Consultations**
Breakwater/Dock/Pier	627
Road Construction/Maintenance	578
Habitat Restoration/Improvement	487
Bridge Repair/Construction	374
Dredging	372
Pilings	363
Culvert	355
Construction - Other	288
Bank Stabilization	275
Fish Passage/Trapping	261
Permits	204
Boat Ramp Repair/Construction	195
Vegetation Management	195
Riparian Work	174
Rip-rap	157
Water Systems	149
Water Diversion	134
Fill	132
Recreation	128
Timber Harvest/Sales	115
Timber Sale - Thinning	112
Trail and Campground Maintenance	109
Erosion Control	108
Stream Rehabilitation	106
Excavation/Mining	100
Channel Repair/Reconstruction	95
Drilling	90
Fishery	86
Stormwater Drainage	84
Wetland Modification	80
Pipeline Construction/Repair	77
Harbor/Marina	75

Table 4-5 Actions involved in Pacific salmon and O. mykiss consultations, NW Region, 2001-2003, by ESU		
Puget Sound chinook salmon Breakwater/Dock/Pier (276) Road Construction/Maintenance (159) Habitat Restoration/Improvement (98) Construction - Other (83) Culvert (76)	**Lower Columbia River chinook salmon** Dredging (260) Habitat Restoration/Improvement (253) Breakwater/Dock/Pier (244) Pilings (240) Road Construction/Maintenance (217)	**Upper Willamette River chinook salmon** Habitat Restoration/Improvement (228) Pilings (216) Breakwater/Dock/Pier (212) Dredging (197) Road Construction/Maintenance (157)
Upper Columbia River chinook salmon Dredging (256) Breakwater/Dock/Pier (253) Pilings (195) Habitat Restoration/Improvement (185) Road Construction/Maintenance (176)	**Oregon Coast coho salmon** Road Construction/Maintenance (97) Habitat Restoration/Improvement (85) Permits (71) Culvert (70) Riparian Work (59)	**Hood Canal chum salmon** Road Construction/Maintenance (57) Fish Passage/Trapping (42) Breakwater/Dock/Pier (40) Habitat Restoration/Improvement (39) Culvert (33)
Columbia River chum salmon Dredging (247) Habitat Restoration/Improvement (232) Breakwater/Dock/Pier (211) Pilings (194) Road Construction/Maintenance (184)	**Ozette Lake sockeye salmon** Road Construction/Maintenance (26) Agriculture (14) Fish Passage/Trapping (14) Habitat Restoration/Improvement (14) Fishery (10)	**Upper Columbia River O. mykiss** Breakwater/Dock/Pier (261) Dredging (259) Pilings (211) Habitat Restoration/Improvement (200) Road Construction/Maintenance (177)

Table 4-5 Actions involved in Pacific salmon and O. mykiss consultations, NW Region, 2001-2003, by ESU		
Snake River O. mykiss Habitat Restoration/Improvement (274) Dredging (263) Road Construction/Maintenance (246) Breakwater/Dock/Pier (232) Pilings (197)	**Lower Columbia River O. mykiss** Dredging (255) Habitat Restoration/Improvement (247) Breakwater/Dock/Pier (242) Pilings (237) Road Construction/Maintenance (219)	**Upper Willamette River O. mykiss** Pilings (220) Breakwater/Dock/Pier (217) Habitat Restoration/Improvement (211) Dredging (189) Road Construction/Maintenance (141)
Middle Columbia River O. mykiss Dredging (257) Habitat Restoration/Improvement (230) Breakwater/Dock/Pier (225) Road Construction/Maintenance (223) Pilings (194)		

4.3.1 Hydropower dams

Hydropower activities represent a relatively small percentage of section 7 consultations regarding Pacific salmon and O..mykiss in the past. The consultations that have occurred, however, have at times been controversial and costly. A number of hydropower actions have been covered in Pacific salmon and O. mykiss consultations, including licensing/relicensing of projects; review of operations plans; construction of new projects; modifications to structures of dams (e.g., installation of fish passage facilities); changes in operations (e.g., change in flow regime); and removal of dams. The major Federal agencies responsible for hydropower activities in the area covered by the 13 ESUs are the Federal Energy Regulatory Commission (FERC), U.S. Army Corps of Engineers (USACE), the U.S. Bureau of Reclamation (USBR) and the Bonneville Power Administration (BPA).

FERC issues licenses for privately owned hydropower projects. These licenses are valid for between 30 and 50 years depending on the extent of proposed new development or environmental mitigation and enhancement measures. The USACE and USBR also own and/or operate hydropower projects within the proposed critical habitat for Pacific salmon and O. mykiss. A collaborative group comprised of the BPA, USACE, and USBR oversees operations of the 31 multipurpose dams of the Federal Columbia River Power System. (FCRPS). While there is no formal procedure for regular review of Federally-operated projects, any change in operations or existing infrastructure may generate consultation regarding impact to the Pacific salmon and O. mykiss.

Multiple hydropower-related Federal and State regulations provide protection to Pacific salmon and O. mykiss. Specifically, section 10(j) of the Federal Power Act (FPA) was promulgated to ensure that FERC considers both power and non-power resources during the licensing process.[7] Further, section 18 of the FPA states that FERC shall require the construction, operation, and maintenance by a licensee at its own expense of a fishway if prescribed by the Secretaries of Interior (delegated to the FWS) and Commerce (NOAA Fisheries). The Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) also incorporates a Fish and Wildlife Program directing the Pacific Northwest Electric Power and Conservation Planning Council to adopt programs to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River system. BPA resources are utilized through this plan to mitigate and enhance fish and wildlife and habitat affected by the development and operation of hydroelectric projects in the Columbia River and its tributaries.[8]

Through the consultation process, NOAA Fisheries may recommend reasonable and prudent alternatives (RPAs) regarding hydropower projects. These RPAs, which we take to be representative of the modifications needed to comply with section 7, may be broadly divided into three major categories: operational, capital, and programmatic. Operational changes are changes in hydropower

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7. Federal Power Act, 16 U.S.C. § 803(j) (1986).

8. Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. §§ 839-839h.

production level or method, and may be engendered by modification to the flow regime.[9] Capital modifications involve direct investment in new or improved infrastructure, and require additional investment for regular operation and maintenance.[10] Programmatic changes include all other types of modification including monitoring of fish passage efficiency and water quality, data collection and research, operation of fish hatcheries, predator control, habitat improvements or restoration, and purchase of land and water rights.[11]

Individual hydropower dams vary substantially in their potential for harming Pacific salmon and O. mykiss, and so the type and extent of necessary modifications varies accordingly. Characteristics such as size and location, as well as the presence or absence of previous modifications, help determine what the most likely range of modification will be. To reflect some of this variability, we divide hydropower dams into several categories, based on generating capacity and the nature of the impacts (modification *v.* removal). We then estimate modification costs for each category.

Recommendations to augment flow or change the timing of flow through a project to facilitate fish passage can have significant economic impacts on a hydropower dam. Demand for power varies seasonally, thus the value of power changes throughout the year. To the extent that flow augmentation requires water to be passed at times of the year when it is less valuable, there may be an associated economic cost. Also, where fish passage through the dam is an issue, seasonal spill over the dam may be required to reduce the risk of fatality associated with passage through the turbines. In this case, the spilled water no longer passes through the turbines and therefore cannot be used to generate electricity. The costs of more expensive electricity may be passed on to the power consumers in the form of rate changes (Peters 2003).

The necessity, level, and method of flow regime changes accommodate the biological needs of Pacific salmon and O. mykiss at a particular project are determined on a case by case basis. Further, the economic impact associated with a flow regime change is dependent upon the type of project.

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9. From a review of historical section 7 consultations regarding hydropower activities, operational changes include recommendations to: improve and manage flows through additional flow augmentation; reduce flow diversions; provide spill to increase fish passage efficiency; operate pools within a specified range; operate turbines within a specified range of efficiency; shut down turbines seasonally; draw down reservoirs; and implement restrictions on ramping rates.

10. From a review of historical section 7 consultations regarding hydropower activities, capital modifications include: constructing and maintaining fish passage facilities (including ladders and screens where applicable); collection and transport of fish at particular sites; installing improved juvenile sampling facilities, surface bypass collectors, and/or spillway weirs.

11. Programmatic changes from a review of a number of historical section 7 consultations include: implementing or improving capture and release programs (e.g., enlarging transport barge exits); monitoring, evaluation, and research programs; gas abatement programs; participation in research initiatives (e.g., investigating bypass improvement methods); managing riparian vegetation; controlling erosion and sediment; implementing timing constraints on in-stream construction; and increased pollution control standards.

For example, replacing power generated by peaking projects (i.e., projects that produce hydropower during periods of highest demand) is more expensive than replacing base power production. Until a hydropower project operation is reviewed, the type and level of flow changes necessary and feasible for species and habitat protection is speculative, and so the data needed to estimate these impacts are not available. ***Because of this, this draft report does not include the economic impacts resulting from changes in flow regimes in the cost ranges associated with each project.*** This likely leads to an understatement of total impacts associated with section 7 implementation for some or all of the ESUs.

Finally, projects belonging to the Federal Columbia River Power System (FCRPS) comprise a unique type of hydropower activity. The U.S. Army Corps of Engineers (USACE) and the U.S. Bureau of Reclamation (USBR) are the owners and operators of the 31 FCRPS hydropower projects on the Columbia and Snake Rivers. The Bonneville Power Administration (BPA) markets and distributes the power generated from these federal dams. BPA also owns and operates about 75% of the Northwest's transmission system.

Of the 31 FCRPS hydropower projects, 22 fall within the boundaries of the potential critical habitat for Pacific salmon and O. mykiss, but all projects may adversely affect that habitat through their operations (USBR et al. 2003). The implementation of section 7 for the 13 Pacific salmon and O. mykiss ESUs under consideration has had significant impacts on the FCRPS, both in terms of capital structures and operations.[12] Attributing these impacts to the designation of critical habitat for a "particular area," however, is problematic for at least two reasons. First, NOAA Fisheries implements section 7 for the FCRPS at the system level, in that the agency applies the jeopardy standard to the system as a whole, not to the operation of individual constituent parts. Because the system spans dozens of watersheds, it is not possible to assign section 7 impacts on an area-by-area basis. Second, the FCRPS is operated as an optimized system subject to constraints, where the optimization involves multiple objectives. The impact of section 7 of the ESA is to add a set of constraints on the system's operation. Because the scale of the FCRPS is so large, this constraint cannot be attributed to a "particular area" on the scale of an individual watershed. Changing the amount or timing of flow at one dam, for example, will produce changes at other dams as the system is adjusted in light of a new constraint. For these reasons, we have included the impacts of section 7 implementation on the FCRPS in this analysis but do not divide those impacts on a watershed-by-watershed basis. As a result, these impacts are treated as an impact of section 7 for the designation of critical habitat, but not an impact of designating a *particular* watershed as critical habitat.

4.3.2 Non-hydropower Dams and Other Water Supply Structures

Projects covered by this activity type include flood control activities, pumping plants, water diversions, water intake structures, and fish screen projects. Generally, Federal agencies, State agencies, regional public agencies, and regional private agencies supply water to end users by means

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12. Section 7 of the ESA was first applied to the FCRPS in 1995, which predates the listing of the 13 ESUs under consideration. The ESUs covered in that biological opinion were Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon.

of highly developed water systems consisting of dams and reservoirs, pumping plants, power plants and aqueducts. Agriculture relies on water diversion for irrigation of crops. Municipal suppliers provide water for both commercial and residential use.

Operation of the Federal water projects is subject to section 7 consultation under the ESA. Any water supplier providing water via contract with U.S. Bureau of Reclamation (USBR) or using infrastructure owned or maintained by the USBR is subject to section 7 consultation under ESA. Projects associated with privately owned diversions may require a Federal permit from USACE under sections 401 or 404 of the Clean Water Act.

The most common water supply activities resulting in section 7 consultations are related to construction or improvement of dams, diversions, and intakes. Infrastructure construction projects have been modified in their design, scope, maintenance requirements, and/or monitoring requirements in order to comply with section 7 for Pacific salmon and O. mykiss. NOAA Fisheries has also recommended adding additional components to a project. For example, to improve habitat in the area surrounding a project, the agency has required rock or woody debris be added to the site. NOAA Fisheries has requested monitoring devices be installed or additional data be collected by the Federal agency or permit applicant. As well, NOAA Fisheries has requested a suite of other minor facility operation and maintenance requirements.

While it is possible to estimate typical costs for modifications to infrastructure, design, and the other changes discussed above, it is more difficult to do so for constraints on the use of the water itself. While historical data exist to inform our understanding of the value of foregone water or agricultural production, we lack reliable data on water quantity changes attributable to section 7 consultation, now and in the future. Currently, there is no apparent consensus concerning how varying flow requirements will be implemented throughout the designation (Huppert et al. 2004).

In addition, as discussed in Section 2, it is very difficult to attribute the costs of impacts on water supply activities to the protection of a specific watershed. Flow changes at one point in a watershed often have biological effects that are felt downstream. If these effects extend beyond the border of the watershed, designation of the neighboring watershed or even others further downstream may trigger constraints on those activities. This means that the impact cannot be attributed to a single area's designation, but instead could come from the designation of any of a number of areas. Spreading costs equally throughout the water system is equally unsatisfactory, as the costs are triggered jointly, not accumulated as more watersheds are designated. ***For these reasons, this draft report does not include the economic impacts resulting from changes in flow regimes in the cost ranges associated with each project.*** This likely leads to an understatement of total impacts associated with section 7 implementation for some or all of the ESUs.

4.3.3 Federal Lands Management and Grazing Permits

A Federal nexus exists for all management activities occurring on Federal lands. We have grouped the activities of the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) into one activity category because the two agencies have many similar land management goals and

regulations, and because they frequently consult together. Activities conducted by the USFS and BLM are wide-ranging, but include fuel reduction activities, road construction, road obliteration, and road maintenance, maintenance of recreation facilities, fisheries programs, timber sales[13], permitting of livestock grazing[14], and permitting of various use permits. We have divided these activities into two activity types: General land management activities (classified into 10 sub-activities) and permitting of livestock grazing.

The recent consultation history shows that nearly 16 percent of section 7 consultations for Pacific salmon and O. mykiss are conducted with the U.S. Forest Service (USFS) or the Bureau of Land Management (BLM) on various land management activities. The outcomes of these consultations are likely influenced by several important baseline regulations. In particular, the Northwest Forest Plan and PACFISH guidelines provide numerous baseline protections to Pacific salmon and O. mykiss.

As noted in the previous section, the Northwest Forest Plan defines Standards and Guidelines (S&Gs) for forest use throughout the 24 million acres of Federal lands in its planning area. Specifically, the NWFP provides S&Gs for management of timber, roads, grazing, recreation, minerals, fire/fuels management, fish and wildlife management, general land management, riparian area management, watershed and habitat restoration, and research activities on USFS and BLM lands. To accomplish its goals, the NWFP defines seven land allocation categories, including "matrix lands," areas where the majority of timber is to be taken, and Riparian Reserves and Key Watersheds, where distances from rivers are set within which many activities are restricted.

For Federal lands in Oregon, Washington, Idaho, and Northern California not covered by the NWFP, USFS and BLM adopted a management strategy specifically for anadromous fish protection.[15] Like the NWFP, PACFISH provides guidelines for timber, roads, grazing, recreation, minerals, fire/fuels management, lands, riparian area, watershed and habitat restoration, and fisheries and wildlife restoration. Standards and guidelines under PACFISH are nearly identical to those in the NWFP.

4.3.4 Transportation Projects

Transportation projects that affect Pacific salmon and O. mykiss habitat are wide ranging. They may include the widening of a road, the reconstruction of a bridge, or the restoration of a ferry terminal. These projects can produce environmental impacts that may directly kill or injure salmon, or may

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13. The consultation history indicates that NOAA consults on timber sales on Federal lands, but not on similar sales on private or other non-Federal lands.

14. The consultation history indicates that NOAA consults on livestock grazing on Federal lands, but does not consult on similar activities on private or other non-Federal lands. The reason for this is that grazing on non-Federal lands rarely needs a Federal permit, and thus does not have a Federal nexus.

15. This strategy was intended to be in place only for 18 months, beginning in February of 1995, but continues to be implemented.

disturb habitat. The impacts can be direct (i.e., riparian destruction during a bridge replacement) or more ancillary (i.e., storm water run-off disturbance following a road widening.

The Federal nexus for a transportation project may be through the permitting or funding provided by the Army Corps of Engineers (USACE), Federal Highways Administration (FHWA) and/or the Federal Aviation Administration (FAA). The USACE permits bridgework, roadwork, and railroad restoration projects that need Clean Water Act permits. FHWA funds bridgework, roadwork, railroad restoration projects, and ferry terminal maintenance, and the FAA permits aircraft/airport repair and maintenance. Roadwork, bridgework, and culvert projects encompass nearly 90 percent of all transportation projects that have been consulted upon.

Examination of biological opinions, case studies, and other data indicate that NOAA Fisheries requires similar project modifications for road, bridge, and culvert projects. Project modifications typically required for transportation projects include pre-construction surveys; the development and implementation of a site-specific spill prevention, containment, and control plan and removal of toxicants as they are released; water quality monitoring; use of boulders. rock, and woody materials from outside of the riparian area; monitoring and evaluation both during and following construction; and a variety of other measures.

4.3.5 Utility Line Projects

Activities classified as utility lines projects typically install or repair pipes or pipelines utilized to transport gas or liquids; cables, lines, or wires used to transmit electricity or communication; and outfall structures of utilities such as waste water treatment plants or powerplants. The projects associated with utility line activities that could impact the salmon include excavation, temporary sidecasting of excavated materials, backfilling of the trench, and restoration of the work site to pre-construction contours and vegetation.

The most common nexuses for utility lines include the Army Corps of Engineers (USACE) and FERC. USACE consults with NOAA regarding 404 Clean Water Act and/or Section 10 River and Harbors Act permits, while FERC consults on pipeline projects that have the potential to impact threatened and endangered species and their habitat.[16] For projects that may impact wetlands or cross water bodies, FERC maintains a list of construction and mitigation procedures. These mitigation procedures include the use of directional drilling, rather than open cut construction, and suggest mitigation activities during the proposal stage (FERC 2003). Therefore, some of the project modification costs estimated to be attributable to Pacific salmon and O. mykiss critical habitat may be overestimated as these measures may already be required.

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16. Robert Arvedlund, Federal Energy Regulatory Commission, personal communication, February 25, 2003

4.3.6 In-stream Activities, including Dredging

Actions associated with in-stream activities that could impact Pacific salmon and O. mykiss include construction or repair of breakwaters, docks, piers, pilings, bulkheads, boat ramp, and docks, and dredging. Although the projects are commonly undertaken by private or non-federal parties, in most cases they must obtain a USACE permit. That agency must then consult with NOAA Fisheries under section 7.

Turbidity associated with in-stream activities may interfere with the species' visual foraging, increase susceptibility for predation, and interfere with migratory behavior. Chemicals and waste materials including toxic organic and inorganic chemicals that accumulate in sediment may be directly toxic to aquatic life or a source of contaminants for bioaccumulation in the food chain. The release of ammonia, a common by-product produced in anaerobic sediments, may affect aquatic species as it is re-suspended in the water column. In-stream activity impacts on invertebrate colonies may result in some loss of salmonid prey. Finally, entrainment of Pacific salmon and O. mykiss can occur during dredging when the fish are unable to overcome the water velocities near the draghead and are pulled into the hold of the ship.

For projects that cover boat docks and ramps, bank stabilization projects, and breakwater and bulkhead projects, the modifications typically needed to comply with the ESA include shoreline planting, construction materials restrictions, use of bubble curtains, habitat improvement, spill prevention contaminant control plan, erosion control, and timing restrictions. For dredging, the necessary modifications include work window constraints, extension of the prescribed work window, additional survey work, and mobilization costs.

4.3.7 National Pollutant Discharge Elimination System Permitted Activities

The EPA and NOAA Fisheries recently authored guidance to States and tribes on the development of temperature criteria deemed protective of salmon and O. mykiss. As a result, facilities in the Pacific Northwest that require permits under the National Pollutant Discharge Elimination System (NPDES) must now ensure that effluent discharge does not raise the temperature in receiving waters above site-specific minimum temperature standards. (EPA 2003). The two agencies have consulted under Section 7 on various aspects of the EPA's approval of State Water Quality Standards. Since the Pacific salmon and O. mykiss ESUs were listed, 14 informal and one formal consultation have been completed. Specifically, activities for which NOAA has consulted with EPA in the past include development of Total Maximum Daily Loads (TMDLs), review of non-temperature related Water Quality Standards, clean up of Superfund sites, and review of pesticide applications. With the exception of pesticide applications, the majority of these activities do not represent a significant portion of the consultation record nor are they expected to increase in the future.[17]

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17. As noted above, the EPA was recently enjoined from authorizing the application of a set of pesticides within a certain distance from "salmon supporting waters" (Washington Toxics Coalition, et al., v. EPA, C01-0132 (W.D. WA), 22 January 2004). Because of the timing of the injunction, however, NOAA Fisheries does not yet have sufficient data to estimate these impacts at the

The only identified incremental standard motivated explicitly by concern for Pacific salmon and O. mykiss involves temperature controls. While NPDES-permitted facilities have always been required to adhere to certain temperature criteria associated with effluent discharge, the 2003 guidance has led to stricter standards where Pacific salmon and O. mykiss are known to spawn or rear. As a result, NPDES-permitted facilities in the Pacific Northwest are required to ensure that their effluent discharge does not raise the temperature in receiving waters above site-specific minimum temperature standards (EPA 2003). To comply with the salmon temperature criteria, NPDES-permitted facilities identify and employ a host of temperature control procedures through Temperature Management Plans (TMPs). Controls include process optimization, pollution prevention, land application, and cooling towers.

4.3.8 Sand and Gravel Mining

Mining activities that affect Pacific salmon and O. mykiss generally include the removal of sand and gravel from active river channels and floodplains for industrial purposes, such as for road construction material, concrete aggregate, fill, and landscaping (NMFS 2002). Gravel mining is an activity permitted by USACE under sections 401 and 404 of the Clean Water Act, or under section 10 of the Rivers and Harbors Act of 1899.

There are three basic types of gravel mining in salmon habitat: dry-pit mining, wet-pit mining, and bar skimming or scalping. Wet-pit mining involves the use of a dragline or hydraulic excavator to remove gravel from below the water table and can directly destroy spawning habitat, increase turbidity, increase suspended sediment, and increase gravel siltation in salmon habitat areas. Gravel bar skimming typically occurs above the water table, but is also considered to significantly impact aquatic habitat by destabilizing the banks and increasing suspended sediment (NMFS 2002). Dry-pit mining occurs outside the active stream channel, and typically is considered by NOAA Fisheries to have fewer direct effects on salmon, though degrading the morphology of the channel is still a concern.[18]

Gravel mining may include impacts such as the loss or degradation of spawning beds a juvenile rearing habitat; migration blockages; channel widening, shallowing, and ponding; loss of hydrologic and channel stability; loss of pool/riffle structure; increased turbidity and sediment transport; increased bank erosion and/or stream bed downcutting; and loss or degradation of riparian habitat (NMFS 2002).

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watershed level. In Appendix H, we present preliminary estimates of the impacts at the ESU level, and for the designation of critical habitat for all ESUs as a whole.

18. Email communication with Erin Strange, NOAA Fisheries, Sacramento Office, December 9, 2003.

4.3.9 Residential and Commercial Development

The potential for adverse economic impacts arising from constrained residential and related development is a frequent concern to communities in which critical habitat has been proposed for designation. The nature and magnitude of any economic impact attributable to critical habitat designation will depend upon baseline land and housing market conditions and the extent to which a designation distorts these initial conditions. A common concern is that the designation of critical habitat may reduce the overall amount of land available to the market, and increase the price of developed land and housing.

If critical habitat designation inhibits the development potential of some parcels, the supply of land available for development will be reduced. In areas that are already highly developed, or where developable land is scarce for other reasons (i.e., non-critical habitat-related regulations), this reduction in available land and the corresponding increase in price could be significant, and ultimately translate into fewer housing units being built within the affected market, affecting both producers and consumers. In areas where developable land is relatively plentiful, however, developers and builders will be able to identify substitute sites for projects, thereby limiting economic impacts to the owners of specific parcels that suffer a diminishment in their land's value.

In addition to the primary economic impacts identified above, commenters on previous economic analyses of critical habitat designation have described additional categories of economic and financial effects in residential and commercial development markets, generally falling into the category of regional economic impacts.[19] Regional economic impacts reflect changes in local output, employment and taxes. The principal category of potential regional impacts associated with critical habitat designation in areas of residential development involves changes in revenues and employment in construction-related firms and other industries that support builders and developers. Specifically, commenters have suggested that if development activity decreases in a given area, these secondary industries are likely to suffer severe economic consequences.

A second category of regional impacts identified by commenters to past critical habitat analyses concerns the potential for forgone tax revenues associated with reduced residential development. That is, reduced development potential in an area may lead to lower real estate and other tax revenues. It is important to note, however, that in many cases any reduction in may be offset by a reduction in municipal expenses. Thus, it is important that any estimated impacts in this category are net of these service expenditures.

Finally, in more extreme cases, concern has been expressed regarding the broader impact of critical habitat designation on regional economies. Specifically, some individuals have questioned whether designation will delay and/or impair an area's ability to realize economic growth by influencing development patterns. Whether further development of a region is, on net, desirable is a point of contention in many markets. Nonetheless, with the exception of cases in which critical habitat

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19. For example, see Elliott D. Pollack and Company (1999).

designation precludes a large proportion of available land from development, designation is unlikely to substantially affect the course of regional economic development. (Meyer 1998).

In some cases, the public may believe that critical habitat designation will depress private property values below the levels associated with anticipated project modifications described above. That is, the public may perceive that, all else being equal, a property that is designated as critical habitat will be stigmatized and have lower market value than an identical property that is not within the boundaries of critical habitat. Public attitudes about the limits and costs that critical habitat may impose can cause real economic effects to the owners of property, regardless of whether such limits are actually imposed.

The designation of critical habitat for the Pacific salmon and O. mykiss ESUs under consideration is unlikely to increase costs to developers, reduce revenues, impose mitigation costs, or result in project delays, at least in significant amounts. There are two reasons significant impacts are not anticipated. First, unlike terrestrial species, habitat for Pacific salmon and O. mykiss is not itself part of the supply of developable land. For this reason, protection of the aquatic habitat need not take the form of supplanting development if the impacts of the development (whatever they might be) can be mitigated. As a result, section 7 consultations regarding the ESUs for real estate developments are usually limited to specific components of the development and are expected to have no direct impact on the supply of land or housing. Second, as seen in the next part of this section, project modification costs are expected to be modest (anticipated to range from $230,000 to $240,000 per project) and, according to NOAA Fisheries personnel, consultations regarding development projects are rare.[20]

This assessment is supported by the consultation history. There have been three formal and four informal consultations regarding residential and related development in recent years. More importantly, none of the formal consultations on development have evaluated the entire project. Past consultations have addressed only the specific activities with a Federal nexus that have the potential to affect Pacific salmon and O. mykiss, such as stormwater outfall structures. Project modifications have included timing restrictions for in-stream work, BMPs, vegetation replacement, filtration systems, and water quality monitoring.

For this reason, the available data also do not support an expectation of significant stigma effects. Section 7 has no strong historical connection to restrictions on private property, and there is no expectation that this lack of a connection will change in the future. If such stigmatization does occur, it seems likely that experience with the actual strictures of critical habitat designation will remove any (negative) premium that might be characterized as a stigma effect.

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20. Personal communication with DeeAnn Kirkpatrick, NOAA Puget Sound Habitat Conservation Division, Fishery Biologist Southern Puget Sound Region, October 31, 2003. Personal communication with Eric Shott, NOAA Fisheries Santa Rosa Field Office Section 7 Coordinator, November 5, 2003. Personal communication with Gary Stern, NOAA Fisheries Santa Rosa Field Office, San Francisco Bay Team Leader, November 5, 2003.

4.4 The Costs of Section 7 Impacts

For the types of activities listed above, enforcing section 7 can have two types of impacts. First, the consultation process itself imposes costs both on NOAA Fisheries and on the Federal agency or other party (or both) responsible for the activity. As explained below, our framework's focus on individual projects and watersheds makes an accurate estimate of these costs problematic. Nevertheless, we discuss them on a general level. Second, modifying a project to bring it into compliance with section 7 may be costly. These costs may occur following consultation, if the party responsible for the activity adopts whatever measures NOAA Fisheries specifies, or they may occur prior to consultation, if the responsible party modifies the activity (either routinely or on a case-by-case basis) in anticipation of the consultation. We account for both cases by assuming that a project located in a critical habitat area will bear these costs, without specifying whether they are incurred prior to or subsequent to consultation.

Because the necessary data are not available, particularly at the geographic scale of the proposed designations, we do not consider two other possible avenues for impacts to occur. We assume that activities located in critical habitat will incur the modification costs identified (with the probabilities we have estimated). Alternatively, the project could be moved (if possible) to a location that does not affect Pacific salmon and steelhead, or the project could be cancelled. A basic assumption underlying any economic analysis, including this one, is that economic actors choose the least costly avenue for their actions. If relocation or cancellation is less costly (accounting for potentially fewer project benefits as well), one of those alternatives would likely be chosen. Therefore, our assumption that projects will not be relocated or cancelled means that our approach likely overstates the cost of section 7 impacts.

4.4.1 Consultation Costs

A routine feature of economic analyses of critical habitat designation is an accounting of the costs of the consultation themselves. The geographic scope of the Pacific salmon and steelhead designations and the nature of the available data preclude a watershed-by-watershed accounting of these costs. Instead, we discuss these costs generally but do not attribute specific costs to particular areas.

The data utilized in this analysis account for the volume of projects that may be modified subsequent to or in anticipation of a section 7 consultation. While the cost of a consultation is a real impact of section 7, it is not easily allocated to a specific area given our methods for assessing project volumes for the following reasons.

First, a single consultation can cover more than one project, sometimes tens or even hundreds. During 2001-2003, formal consultations averaged 1.72 projects per consultation, and covered as many as 75. Informal consultations averaged just 1.16 projects per consultation but ranged up to 54. Table 4-6 shows the distribution of the number of projects covered in a consultation by the type of consultation for Pacific salmon and steelhead consultation during 2001-2003. While more than 90% of all consultation cover a single project, the exceptions are important. For example,

programmatic consultations determine how a type or types of project, not the projects themselves, can be modified to ensure they comply with section 7. As a result, these consultation typically cover large numbers of projects. For example, one programmatic consultation covers culvert replacements by the Forest Service in Washington State and eastern Oregon National Forests (NMFS 2003k). The consultation covers up to 120 projects per year. Another programmatic consultation covers land management practice by the Forest Service and Bureau of Land Management in northwestern Oregon (NMFS (2003j). The consultation extends to projects located in 3.9 million acres of Federal land and accounts for thousands of individual projects.

Table 4-6
Consultations covering Multiple Projects

Number of Projects*	Type of Consultation				
	Formal	Informal	Programmatic	Other	All Types
1	365	1397	13	222	1997
2-5	32	19	2	15	68
6-10	10	1	5	6	22
More than 10	6	8	5	8	27

*In the case of a programmatic consultation, the number of projects sometimes refers to the number of project types. The projects themselves can number in the hundreds.

While programmatic consultations are likely to be more costly, applying a constant per-project cost estimate would significantly inflate the estimated level of consultation cost. Moreover, when multi-project consultation occur, they are likely to cover a wide geography. This makes it difficult to attribute those consultation costs to a particular area such as a single watershed.

A second difficulty stems from the method we have used in this analysis to measure the volume of Federal lands management activities, a significant source of cost impacts. Based on an analysis of programmatic consultations, we have used a per-acre cost estimate, rather than a per-project estimate. Because of this, there is no way to gauge the number of consultations associated with the level of activity in a particular area. In any case, given that many of these activities are in fact covered by programmatic consultations, using the number of projects to estimate consultation costs would be inaccurate. For both of these reasons, we do not estimate consultation costs for each particular area.

This does not mean these costs are insignificant. As shown above in Table 4-3, Pacific salmon and O. mykiss FWS 2004 have been the subject of over 2100 consultations during 2001-2003. The FWS has estimated costs associated with their consultations, and while there is no assurance that NOAA Fisheries costs are similar, using the FWS estimates can still give some indication of the potential magnitude of these costs. The FWS estimates that a formal consultation costs the Federal government between $10,000 and $40,000, while an informal consultation costs about $1,100.[21] Using the high end of the formal consultation range for programmatic consultations, and the

21. FWS (2004), Exhibit 3.1.

informal consultation estimate for other types of consultations, gives the following cost estimates for Pacific salmon and steelhead consultations during 2001-2003:

- Formal: $4.2 - 16.6 million
- Informal: $1.6 million
- Programmatic: $1.0 million
- Other types: $276 thousand
- Total cost: $7.1 - $19.5 million

Without data on NOAA Fisheries own per-consultation costs, it is difficult to gauge the reasonableness of these estimates. In any case, as we have noted above, it may be difficult to attribute this type of cost to a particular watershed.

4.4.2 Per-project Costs and the Occurrence of Impacts

For each type of activity, we developed estimates of the costs for modifying a project to comply with section 7, and of the volume of the activity in each watershed. These two estimates are the basic elements of the approach used in the analysis. Our method for making these estimates took the following steps:

1) Estimate the cost of project modifications. For most activity types, modification costs are borne in one year and so no discounting is needed (for this step). For others, expenditures on modifications are likely to take place over a number of years. In these cases, we discounted the stream of expenditures using both a 3% and 7% discount rate. (For the purposes of the discussion in this report, we sometimes give only the results for the 7% discount rate.[22] The summary tables and the full set of results in the appendices report the results for both discount rates.)

2) Determine a forecast period. Traditionally, an economic analysis uses a single time frame over which all impacts and costs are estimated. The data sources we used, however, vary widely in the length of time covered. For that reason, we used individual time periods over which to forecast an activity type's occurrence. In some cases, we used a period of one year, as we have estimates of the annual volume of an activity. In other cases, the period is longer, sometimes set by the periodicity of permits or other considerations.

3) Estimate the probability that a project will be modified in a particular year during the forecast period. We assumed that not all projects will require immediate modification to comply with section

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22. In many instances, changing the discount rate does not change the cost estimate because we report annualized costs and the cost stream is uniform. The uniformity comes from the assumption that, for most activities, modification costs are borne in one year but the exact date is uncertain and the probability the costs will be borne in a given year is assumed to be distributed uniformly over the forecast period. Under these assumptions, the annual expected value (that is, the one-year modification cost multiplied by the probability of the modification occurring in that year) is constant, and is therefore equal to the annualized expected cost regardless of the discount rate.

7. In some cases, we assume those modifications are certain to take place in a particular year (e.g., the year of a FERC license renewal). In other cases, we used the consultation record to estimate a probability distribution over the forecast period. In still others, where no information on the probability distribution is available, we assumed it is uniformly distributed through the forecast period.

4) Calculate the annual expected cost of project modifications. The cost estimate obtained in the first step is the certain cost of modifying the project. In third step, however, we recognize that the need to modify a project is uncertain, and so this last step incorporates the probabilities estimated in that step. We first calculated the expected cost of modifications for a particular year (the probability that the modification will take place in a given year × the cost of modification) for each year in the forecast period. We then discounted each year's expected cost (again, we used both a 3% and 7% discount rate) and took their sum to obtain the present value of the expected modification costs. Because the forecast period varies across activity types, however, using the present value will give relatively high costs for those activities with longer forecast periods. For that reason, we annualized this present value to obtain an annual expected modification cost.[23]

In almost all cases, we present a range of possible modification costs. Because our data sources for the cost estimates do not constitute a random sample, we chose not to use an average over the set of estimated costs in our data as the "representative" estimate. Instead, we assumed that the endpoints of the range represent the minimum and maximum values of a symmetric cost distribution, and used the midpoint of the range as the representative cost estimate.

In the remainder of this section, we summarize the methods for deriving cost estimates for that activity's modifications, as well as give the estimates and their ranges (assuming a 7% discount rate). Following that, we describe how the spatial and temporal occurrence of the activity was estimated. Finally, for each activity we present some of the potential limitations of the analysis. The discussion below is summarized in Table 4-8, and a more detailed presentation is given in Appendix D.

4.4.2.1 Hydropower Projects

Cost Estimates

For hydropower dams, the magnitude of potential modification costs varies widely across dams. To account for some of this variation, we divided this activity type into several categories.

- Projects with installed capacity of less than 5MW: $2.1 million ($24,000 - $4.2 million). According to FERC guidelines, hydroelectric projects with an installed capacity of less than five

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23. Incorporating uncertainty over time in this way means that the actual modification costs for a specific activity may vary substantially from our estimates on a year-to-year basis. Taking the expected cost over time produces an estimate of the *average* cost over the forecast period. The actual level of costs, however, may be zero for all years but one, and very high in that one year. Because the one year of the actual costs is uncertain, expressing costs as an expectation enables us to compare levels of costs across activities with different probability distributions.

megawatts (MW) may be exempted from the licensing process. Because these projects are not currently generating power, or are generating power in small amounts, estimated costs are based on the project modification costs of non-hydropower dams, which are anticipated to range between from $24,000 to approximately $4.2 million.

- Projects with installed capacity ranging from 5 to 20 MW: $5.76 million ($0 to $11.5 million). The high-end of this estimate comprises: 1) Capital costs, such as facilities improvements, of $8 million, from a survey of 17 hydropower projects in the Northwest United States; 2) Species surveys at $2,600 per year for ten years (BPA 1992), 3) Research on species survival and passage efficiency at $150,000 per year for ten years (Huppert et. al. 1996); and 4) Water quality monitoring at $200,000 per year for ten years (Huppert et. al. 1996). These costs represent the suite of project modifications most likely to be recommended at medium-sized hydropower projects.
- Projects with installed capacity of greater than 20 MW that do not have but may require, fish passage facilities: $73.85 million ($11.5 million to $136 million). The high-end of the cost range is the high-end cost for project modifications to a hydropower project from a survey of utility companies and Public Utility Districts in the Pacific Northwest. The estimate includes annual costs of fish-related operations (hatchery and spawning operations, predator control studies, fish ladders and operations, fish survival studies, etc.), fish-related maintenance (fish ladder and bypass maintenance), and associated debt services (surface collector, diversion screens juvenile fish bypass system, etc.) projected over ten years.
- Projects with installed capacity of greater than 20 MW that have, or will not require, fish passage facilities: $45.23 million ($11.5 million to $79.1 million). The Pacific Northwest Hydrosite Database (PNHD) used for the hydropower analysis includes information on the status of fish passage facilities at each project, specifying that facilities are present, not required, not present, or unknown. Where passage facilities were determined to be present or not required, the average costs of related operations and maintenance of these facilities was removed from the high-end estimate in the cost range (i.e., high-end estimate of $136 million less approximately $57 million over ten years for fish passage-related costs).
- Costs of dam removal: $24 million. The analysis found that 4 dams are likely to be removed in the future due to salmon concerns. The cost estimate for dam removal is based on estimated cost of removal of Bull Run Dam on Sandy River from a NWR survey. Costs include capital costs of deconstruction and land donation.
- Dams with known/planned modification costs: various. In the course of the hydropower analysis, multiple utility companies and Public Utility Districts were interviewed regarding the costs of anticipated project modifications to comply with the Endangered Species Act for the salmon. Where project-specific costs were available, these costs were applied in the analysis (for 17 projects in the Northwest Region). Per project total nominal costs resulting from the survey range from approximately $162,000 to $136 million.
- FCRPS projects. We treat the hydropower projects that comprise the FCRPS as a distinct category of hydropower activity. While there is a rich historical record covering capital, operations, and maintenance expenditures on conservation projects and the cost of power generation lost or replaced due to conservation measures, this record does not clearly distinguish impacts attributable to the implementation of section 7 from impacts attributable to the Northwest Electric Power Planning and Conservation Act . Moreover, NOAA Fisheries has issued a draft revised biological opinion covering the FCRPS but will not issue a final opinion until November 30, 2004, making it difficult

to project what impacts will occur subsequent to critical habitat designation. With these *caveats* in mind, we note that a recent NOAA Fisheries report (NMFS 2004g) to Congress estimated that BPA's expenditures on fish and wildlife conservation measures in 2003 totaled approximately $532.9 million, $503.6 million of which is attributable[24] to the 13 Pacific salmon and O. mykiss ESUs under consideration:

Table 4-7
Impacts of Section 7 Implementation on the FCRPS

BPA Program Element	Annual Cost (millions)	Annual Cost attributable to 13 ESUs (millions)
Fish & Wildlife Direct Program	$139.0	$111.2
Treasury Repayment for Past Capital Investments[25]	$56.7	$56.7
Operations and Maintenance (for fish)	$33.4	$33.4
Lower Snake River Compensation Plan Hatcheries	$15.1	$7.6
Power Planning Council	$4.0	$4.0
Transmission (attributable to fish and wildlife)	$34.7	$27.8
Lost/replacement power generation[26]	$250.0	$250.0
Total Annual Costs	**$532.9**	**$503.6**

Whether these figures accurately reflect future levels of impacts is unknown.

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24. We attributed the expenditures to the 13 ESUs in the following way. For Fish & Wildlife Direct Program costs, we multiplied the reported Annual Cost by the proportion of Fish & Wildlife Direct Program costs for FY2001 and FY2002 that were attributable to anadromous fish, as reported in Table 3, Appendix A in NPCC (2004). We applied the same proportion to the Transmission Annual Cost. For Lower Snake River Compensation Plan Hatcheries Annual Costs, we used a factor of 50%, which reflects the approximate proportion of the steelhead smolts in the total release of the hatcheries covered by the plan (FWS 2002).

25. This amount represents depreciation, amortization and interest on fish and wildlife capital investment, both for past Congressional appropriations of approximately $85 million annually for Corps of Engineers capital improvement at dams, and for the capital portion of BPA Fish and Wildlife program (for example, to construct hatcheries), funded by Treasury bonds.

26. About 10% of the productive capacity of the Federal hydropower system is devoted to spill and flow augmentation. The cost of these measures varies considerably from year to year. In 2003 it was approximately $250.0 million.

Spatial Distribution
- We used latitude/longitude data from the Pacific Northwest Hydrosite Database (Bonneville Power Association) and the USACE National Inventory of Dams for all hydroelectric projects in the NWR to project spatial occurrence. We did not include the FCRPS projects in this projection.

Temporal Distribution
- For Federal Energy Regulatory Commission (FERC) licensed dams, section 7 consultation and subsequent project modification is anticipated to begin concurrent with the expiration of the current FERC license.
- Federal dams are not subject to FERC relicensing and, as such, operations may not be reviewed on a standard schedule. Some Federal hydroelectric projects undergo an operations review approximately every ten years. This analysis assumes that consultation for Federal dams will occur sometime within the next ten years for each Federal hydropower project. An equal probability is assigned to this consultation beginning in each year over the next ten years (i.e, a consultation has a ten percent probability of occurring in any given year).
- Dams with installed capacity less than 5MW are assumed to have a ten percent probability of incurring modification costs during the next twenty years, with the probability distributed uniformly over the period.
- Where the licensing information is not available, this analysis assumes that consultation will occur sometime over the next 30 years, due to the fact that FERC licenses typically last 30 to 50 years. This analysis assigns an equal probability to this consultation beginning in each year over the next 30 years.
- Costs of project modifications to hydropower projects are assumed to be incurred uniformly over a ten year time period beginning in the year of potential section 7 consultation.

Caveats
- Spatial data for hydropower projects may vary according to data source. This is due to the fact that data sources may map the location of any number of components of the project, including dam infrastructure, turbine, powerhouse, afterbay, or forebay. To the extent possible, this analysis uses the location of dam infrastructure for the spatial analysis. No comprehensive dam location and attribute data layer exists, however. Certain instances have been identified where dam locations vary across different data sources. The location of every dam in the data layers has not been independently corroborated.
- No comprehensive forecast for consultations at hydropower dams exists. To estimate the expected start date for future consultation, this analysis employs a combination of methods based upon FERC relicensing schedules, operating review schedules for certain Federal dams, and a 30 year uniform probabilistic distribution of consultation for the remaining dams. In addition, it is assumed that once consultation and modifications commence, related expenditures will occur uniformly over a ten year time frame following consultation. In reality, start dates, duration, and distribution of consultations and modifications across all dams may vary from these assumptions.
- Hydropower projects may be required to provide additional flow for Pacific salmon and O. mykiss, and as a result may experience significant economic impacts to the extent that increased flow results in decreased or redistribution of power generation. Specific dam projects that will be required to provide this flow, and how (e.g., spill) the flow augmentation may be achieved, are difficult to

predict. The likelihood of a particular project being required to provide flow for salmon will depend on many factors, including biological significance of the dam project to Pacific salmon and O. mykiss survival and recovery, the seasonality of flow, the economic importance of the dam project, whether there is public concern over the project, and other factors. ***As a result, costs associated with flow requirements are not included in estimates of modification costs for hydropower projects.***

4.4.2.2 Non-Hydropower Dams and Water Supply Structures

Cost estimates

- Infrastructure costs: $2.1 million ($24 thousand to $4.2 million). For dams other than hydropower projects, infrastructure costs to accommodate salmon needs were estimated from several case studies of municipal water intake projects (estimated to range from $24,000 to $670,000). Using PNHD data, costs to install fish passage and fish screens were estimated to range from $92,000 to $4.2 million. Because dam projects may bear any combination of the costs estimated, costs are estimated to range from $24,000 to $4.2 million for dams that are required by section 7 consultation to accommodate Pacific salmon and O. mykiss needs. The current analysis assumes that all federally regulated non-hydropower dams and dams with large reservoirs (defined as dams in the 90th percentile or higher of reservoir storage capacity) are certain to bear costs associated with salmon needs at some point over the next 20 years. This time frame reflects the past rate of formal consultation on non-hydropower related projects in our consultation record (approximately 10 per year). Other non-hydropower dams are assumed to have a ten percent probability of consultation and modification during this period.
- Operation of Water Projects (e.g., flow regime, withdrawal constraints): Not quantified. Costs to provide additional water flow for salmon are difficult to estimate because reliable data on water quantity changes attributable to section 7 consultation, now and in the future, do not exist. There also does not appear to be a consensus of how varying flow requirements will be implemented throughout the designation. Further, attributing costs to provide flow to a specific watershed is difficult because water supply constraints in one watershed often have effects that are realized throughout the water system.

Spatial Distribution

- We used latitude/longitude data for dams other than hydroelectric projects from the USACE National Inventory of Dams to project the spatial occurrence of this activity type, covering 1454 dams. In addition, dams in the Pacific Northwest Hydrosite Database that are not currently producing hydropower and have a purpose in addition to hydropower (e.g. flood control or recreation) are also included.

Temporal Distribution

- Limited data exist regarding maintenance schedules for non-hydropower projects. This analysis assumes that a consultation, if it occurs, will occur sometime over the next 20 years, based on the historic frequency of consultation of these project types.
- We assume that Federally regulated dams and dams with large reservoirs are certain to face consultation and modification during a twenty year period, with the probability distributed uniformly

across this period. Other non-hydropower project dams are assigned a probability of incurring costs related to Pacific salmon and O. mykiss of ten percent.

Caveats

- Spatial data for dam projects other than hydropower projects may vary according to data source. This is due to the fact that data sources may map the location of any number of components of the project, including dam infrastructure, as separate features. To the extent possible, this analysis uses the location of dam infrastructure for the spatial analysis. Certain instances have been identified where dam locations vary across different data sources. The location of every dam in the data layers has not been independently corroborated.
- No comprehensive forecast for consultations at non-hydropower dams exists. Consultations at particular non-hydropower projects are assumed to occur with uniform probability over the next 20 years.
- While dam projects may be required to provide additional flow for salmon may experience significant impacts, the specific dam projects that will be required to provide this flow are difficult to predict. The likelihood of a particular project being required to provide flow for salmon will depend on many factors, including biological significance of the dam project to salmon survival and recovery, the seasonality of flow, the economic importance of the dam project, whether there is public concern over the project, and other factors. ***As a result, costs associated with providing additional flow for Pacific salmon and O. mykiss are not included in estimates of modification costs for non-hydropower and water supply projects.***

4.4.2.3 Federal Land Management Activities (excluding grazing)

Cost estimates

- Land management activities (excluding grazing): $0.68 to $8.71 per acre per year, depending on region. Programmatic activities of the Bureau of Land Management (BLM) and U.S. Forest Service (USFS) are grouped into one category because they have similar land management goals and regulations, and because they frequently consult together. Locations of future USFS projects are projected using data from quarterly Statement of Proposed Actions (SOPAs) released by national forests. Within each of three regions (Idaho, Eastern Oregon/Washington, Western Oregon/Washington), SOPA projects are grouped into ten activity categories. To create an estimated frequency of these activities, a regional average number of activities from SOPAs was estimated on an annual basis. Projects occurring on BLM lands are assumed to occur with the same relative frequency as those occurring on national forest lands within the same region.
- For each category of activity, past section 7 consultation project modifications were documented and costs were estimated. We developed per-acre estimates of project modification costs using the average annual number of projects for each forest divided by forest acreage. Nominal annual cost estimates for each region are 1) Idaho: $1.26 ($0.68 to $1.84) per acre; 2) Eastern Oregon/Washington: $3.30 ($1.62 to $4.98) per acre; and 3) Western Oregon/Washington: $5.90 ($3.08 to $8.71) per acre.
- Costs of project modifications to programmatic Federal land management projects are incurred in one year.

Spatial Distribution
- The locations of future USFS projects are projected using data from Statement of Proposed Actions (SOPAs) released by specific National Forest Units. This analysis identifies acres of land within BLM Districts and National Forests per watershed within each of the three regions (Idaho, Eastern Oregon/Washington, Western Oregon/Washington). Data from representative SOPAs are averaged to provide an estimate of the types of projects that may occur on these Federal lands. The number of activities projected to occur in the proposed critical habitat is then based on the acreage of Federal lands in each watershed.

Temporal Distribution
- On average, the number of projects listed in each SOPA generally represents the number of projects that will occur on a national forest in a given year.
- Projects occurring on BLM lands are assumed to occur with the same relative frequency as those occurring on USFS lands within the same region.

Caveats
- This analysis assumes that the SOPA lists all proposed and ongoing activities occurring within each national forest, and that these activities tend to occur with seasonal regularity.
- This analysis assumes that the amount of Federal lands management activity within each watershed that is impacted by section 7 is related to the amount of Federal land within that watershed.

4.4.2.4 Livestock Grazing on Federal Land

Cost estimate
- Livestock Grazing: $29.00 per acre per year ($11.00 to $48.00). Grazing on Federal lands requires a permit from the land management agency. Direct costs of compliance with section 7are estimated by grazing allotment on a per-acre basis. These costs are then distributed according to the amount of Federal grazing lands in each watershed. We assume the modification costs are borne in one year.

Spatial Distribution
- We identified Federal grazing lands by intersecting spatial coverages for statewide grazing allotments with a USFS/BLM ownership coverage in the study area. The analysis employs the Interior Columbia Basin Ecosystem Management Project (ICBEMP) spatial data for grazing.

Temporal Distribution
- This analysis assumes that each acre of Federal lands grazing will bear modification costs for section 7 consultations related to Pacific salmon or O. mykiss at some point over the next ten years, when the permit is renewed. This analysis assumes an equal probability of the consultation occurring in a given year within the ten year period.

Caveats
- Each acre of grazing land within critical habitat areas is assumed to be subject to section 7 implementation. In fact, many projects may not affect salmon and O. mykiss habitat.

4.4.2.5 Transportation projects

Cost estimates

- Bridge and Culvert Projects: $41,778 - $98,278 per project (range depends on project mileage). Transportation projects are typically required to have a consultation when they involve permitting or funding by the Army Corps of Engineers (USACE), Federal Highways Administration (FHWA) and/or the Federal Aviation Administration (FAA). We developed per-project estimates of the direct costs of compliance with section 7 using cost per project miles for variable costs combined with per project fixed costs. Project modification costs include bank stabilization, monitoring and evaluation, habitat improvement, spill prevention contaminant control plan, erosion control, and timing restrictions, and so forth.
- Road Projects: $36,778 - $85,278 per project (range depends on project mileage). Transportation projects are typically required to have a consultation when they involve permitting or funding by the Army Corps of Engineers (USACE), Federal Highways Administration (FHWA) and/or the Federal Aviation Administration (FAA). Per project estimates of the direct costs of compliance with section 7 are developed using cost per project miles for variable costs combined with per project fixed costs. Project modification costs include bank stabilization, monitoring and evaluation, habitat improvement, spill prevention contaminant control plan, erosion control, and timing restrictions, etc.
- Costs of project modifications to transportation projects are assumed to be borne in one year.

Spatial Distribution

- The location of transportation projects is based on spatial data from transportation plans for Washington (2003 to 2007), Idaho (2002 to 2005), and Oregon (2002 to 2005) that identify locations of historic and future projects.

Temporal Distribution

- Although the transportation plans vary in scope (three to six years), it is assumed that the point locations of these projects represent "typical" locations of transportation projects initiated and completed over a five year time horizon.

Caveats

- According to the transportation plans, the vast majority of projects are forecast to occur within a five-year time frame. This analysis therefore employs a forecast period of five years for transportation projects and assumes that all scheduled projects will occur within this forecast period. In reality, a number of projects are scheduled to occur beyond the forecast period. In these instances, this analysis overstates the costs of these projects.
- Spatial data identifies the location of specific transportation projects expected to occur over a given time period. Because the time frame of transportation plans do not match the 2003 to 2008 forecast period for the analysis, the actual locations of future projects may differ slightly from those listed in the transportation plans, but are expected to occur in similar geographic areas (e.g., urban centers).

4.4.2.6 Utility Line Projects

Cost estimates
- Outfall Structure and Pipelines: $101,000 ($100,000 to $102,000). Utility line projects are typically required to have a consultation through a connection with USACE permits for outfall structure and pipeline projects. This estimate represents the midpoint of a range of costs for modifications typically found in consultations. These modifications include erosion control measures, directional drilling, construction site restoration and cleanup, timing restrictions, and so forth.

Spatial Distribution
- The location of utility projects is based on the latitude and longitude of historic USACE permits for utility line and outfall structure projects. Permit data were collected from the Portland, Seattle, and Walla Walla USACE Districts. The data include locations of permits from approximately 1996 to 2003, and vary by district.

Temporal Distribution
- This analysis assumes that consultation related to projected permit applications is certain to occur sometime within the next eight years. An equal probability is assigned to these consultations beginning in each year over the next eight years.

Caveats
- We assume that the historic location of USACE permits for utilities is the most reasonable predictors of future locations available.

4.4.2.7 In-stream activities (excluding dredging)

Cost estimates
- Boat Dock, Boat Launch, Bank Stabilization: $54,500 ($25,000 to $84,000). Boat dock, boat launch, and bank stabilization projects are typically required to have a consultation through a connection with USACE permits. This estimate represents the midpoint of a range of costs for modifications typically found in consultations. These costs include shoreline planting, construction materials restrictions, use of bubble curtains, habitat improvement, spill prevention contaminant control plan, erosion control, and timing restrictions, and so forth.

Spatial Distribution
- The location of in-stream projects is based on the latitude and longitude of historic USACE permits excluding 1) activities likely to be captured elsewhere in the analysis (e.g., roads, bridges, dredging), and 2) activities not included in the analysis (e.g., restoration). Permit data were collected from the Portland, Seattle, and Walla Walla USACE Districts. The data include permits from 1996 to 2003, and vary by district.

Temporal Distribution
- This analysis assumes that consultation related to projected permit applications is certain to occur sometime within the next eight years. An equal probability is assigned to this consultation beginning in each year over the next eight years.

Caveats
- We assume that the historic location of USACE permits for utilities is the most reasonable predictors of future locations available.

4.4.2.8 Dredging projects

Cost estimates
- Dredging: $821,000 ($332,000 to $1,300,000). Dredging projects are typically required to have a consultation through a connection with USACE permits. This estimate represents the midpoint of a range of costs for modifications typically found in consultations. These costs include work window constraints, extension of the prescribed work window, additional survey work, and mobilization costs.

Spatial Distribution
- The location of dredging projects is based on the latitude and longitude of historic USACE dredging permits. Permit data were collected from the Portland, Seattle, and Walla Walla USACE Districts. The data include permits from 1996 to 2003, and vary by district.

Temporal Distribution
- For the purposes of this analysis, it is assumed that consultation related to projected permit applications is certain to occur sometime within the next eight years. An equal probability is assigned to consultation beginning in each year over the next eight years.

Caveats
- We assume that the historic location of USACE permits for utilities is the most reasonable predictors of future locations available.

4.4.2.9 NPDES-permitted Activities

Cost estimates
- Temperature Management Plan Compliance activities for Major Projects: $630,467 ($476,483 to $784,457). National Pollutant Discharge Elimination System (NPDES) permitted facilities are required to ensure effluent discharge does not raise the temperature in receiving waters above site-specific minimum temperature standards. The section 7 consultation record indicates salmon concerns have produced more restrictive measures for temperature controls. The high end of the range includes annual operation and maintenance costs of up to $35,000 and total capital costs of $425,000. This range in costs represent direct compliance costs for "major" NPDES facilities, defined as those facilities discharging greater than one million gallons per day based on an EPA

economic assessment of four major NPDES-permitted facilities in Oregon (Science Applications International Cooperation 2003).
- Temperature Management Plan Compliance activities for Minor Projects: $72,039 ($0 - $144,078). The high end of the range includes annual operation and maintenance costs of up to $6,800. The range in costs represent direct compliance costs for "minor" NPDES facilities, defined as those facilities discharging less than one million gallons per day based on an EPA economic assessment of a sample of five minor NPDES-permitted facilities in Oregon.

Spatial Distribution
- The location of future consultation regarding compliance with temperature water quality criteria is based on the latitude and longitude of major and minor National Pollutant Discharge Elimination System (NPDES) permitted facilities within the proposed critical habitat. This analysis assumes facilities will undertake various measures to ensure the temperature of surrounding waterways do not exceed regulatory standards developed specifically to protect Pacific salmon and O. mykiss.
- Permit data were collected from the Washington Department of Ecology, Oregon Department of Environmental Quality, EPA Region 10, and EPA Region 9 and represent the location of facilities as of 2003 or 2004.
- Based on the historical section 7 consultation record, not all NPDES-permitted facilities are likely to undergo section 7 consultation. Accordingly, the analysis assumes that 25 percent of major facilities and 20 percent of minor facilities will incur costs, based on an EPA study examining the economic impact to facilities of the temperature regulations. The volume count of activities per watershed is adjusted to reflect this probability.

Temporal Distribution
- The analysis assumes that consultations related to temperature compliance will occur immediately (with the probabilities specified above).

Caveats
- EPA's study assumed that facilities in designated spawning and rearing watersheds would incur temperature management costs.
- Due to lack of sufficient location data (i.e., specific latitude and longitude of facilities) for Idaho, permit location is based on the centroid of the relevant facility zip codes.

4.4.2.10 Sand and Gravel Mining

Cost estimates
- Sand and gravel mining: $676,532 ($0 to $1,353,065). Sand and gravel mining activities typically require USACE permits under section 401 and 404 of the Clean Water Act. Using a case study, this analysis estimates the cost of reductions in the volume of gravel production due to section 7 implementation using a case study. In this case study, we estimated the loss in net revenues to be approximately $11,000 per mile annually was estimated, assuming no substitution of alternate sites, for a present value of $1.35 million for the whole site over the life of the permit. Because some projects are unlikely to require modifications for salmon (for example, if they occur on non-fish-

bearing streams or outside the Pacific salmon and O. mykiss spawning season), we assume that each site has a 50% probability of being required to modify its operations.

Spatial Distribution
- Locations of ongoing and potential mining sites were identified using latitude/longitude data from the USGS "Active Mines and Mineral Plants" (1997).

Temporal Distribution
- This analysis assume there exists an equal probability of consultation beginning in each year over the next 30 years.

Caveats
- This analysis may overstate the likelihood of consultations on sand and gravel mining because not all active and potential mine sites are likely to bear costs for salmon conservation measures. The likelihood of future consultation at a particular site depends on the several factors including the season in which mining activity occurs and the proximity of the mine to fish-bearing streams.

4.4.2.11 Residential and Commercial Development

Cost estimates
- Residential and Commercial Development: $235,000 ($230,000 to $240,000). Development projects are typically required to have a consultation through a connection with stormwater permits. This estimate represents the midpoint of a range of costs associated with constructing a stormwater management plan that conforms with salmon requirements. This includes costs of the stormwater pollution prevention plan, permanent stormwater site plan, and stormwater best management practice operation and maintenance.
- Based on the section 7 consultation record, not all permit applications undergo section 7 consultation. Accordingly, the analysis applies a probability of six percent, representing the proportion of all permits likely to undergo consultation in each watershed relative to the total number of permits in each watershed potentially burdened by consultation. This probability is based on a review of State-issued NPDES stormwater permits resulting in section 7 consultation with the Seattle District of the USACE over the past three years. As a result, six percent of all projected State permits in each watershed are presumed to be burdened by section 7 consultation and related compliance costs.

Spatial Distribution
- As a proxy for the location of development activities potentially burdened by compliance requirements, the analysis employs recent NPDES stormwater permit data by state for residential and commercial development. Specifically, the analysis assumes that the number and location of future development activities constrained by Pacific salmon and O. mykiss protections are reasonably approximated by the proportion of NPDES stormwater permits resulting in consultation in the past.
- These historical permit data were collected from the Washington Department of Ecology, Oregon Department of Environmental Quality, and EPA Region 10. Industrial permit data were excluded,

as this activity is captured through the analysis of EPA water quality regulations, utility, and in-stream projects. In general, the analysis relies on approximately three years of State NPDES stormwater permit data.

Temporal Distribution
- For the purposes of this analysis, it is assumed that consultation related to projected permit applications will occur sometime within the next 20 years. An equal probability is assigned to this consultation beginning in a given year over the next 20 years.

Caveats
- Availability of historic permit data varies by State. For example, Idaho permit data is available a portion of 2003 and 2004, whereas Oregon data include information extending back up to four years. This analysis uses permit activity locations for the available years to projected NPDES-permitted activity over the 20 year forecast period.

4.5 Summary

Table 4-8 below summarizes the cost estimates for the different types of activities.

Table 4-8
Summary of Activity Cost Estimation

Activity	Sub-activity	Cost Unit	Midpoint Cost Estimate	Present Value of Cost Stream	Forecast Period	Likelihood of Modifications	Annual Expected Cost
Hydropower Dams*	Small (0-5 MW)	per dam	$2,120,000	$2,120,000	20 years	10% over 20 years	$10,600
	Medium (5-20 MW)		$5,750,000	$5,750,000	50 years	100% over 50 years	$115,000
	Large (>20 MW), requires fish passage		$73,850,000	$73,850,000	50 years	100% over 50 years	$1,477,000
	Large (>20 MW), does not require fish passage		$45,230,000	$45,230,000	50 years	100% over 50 years	$904,600
	Large (>20 MW), fish passage unknown		$56,390,000	$56,390,000	50 years	100% over 50 years	$1,127,800
	Unknown capacity		$7,400,000	$7,400,000	30 years	100% over 30 years	$246,667
Non-hydropower Dams	Federal and large non-hydropower dams	per dam	$2,120,500	$2,120,500	20 years	100% over 20 years	$106,025
	Small non-Federal Non-hydropower dams					10% over 20 years	$10,603

Table 4-8
Summary of Activity Cost Estimation

Activity	Sub-activity	Cost Unit	Midpoint Cost Estimate	Present Value of Cost Stream	Forecast Period	Likelihood of Modifications	Annual Expected Cost
Federal Land Management Activities	Idaho	per acre	$1.26	$1.26	1 year	100%	$1.26
	Western Oregon & Western Washington		$5.90	$5.90			$5.90
	Eastern Oregon & Eastern Washington		$3.30	$3.30			$3.30
Livestock Grazing on Federal Land	Grazing	per acre	$29.00	$29.00	10 years	100% over 10 years	$2.90
Transportation**	Bridges & culverts (small)	per project & mile	$27,800 + variable costs	$41,778	5 years	100% over 5 years	$8,356
	Bridges & culverts (medium)		$55,500 + variable costs	$69,478			$13,896
	Bridges & culverts (large)		$84,300 + variable costs	$98,278			$19,656
	Roads (small)	per project & mile	$22,800 + variable costs	$36,778	5 years		$7,356
	Roads (medium)		$47,000 + variable costs	$60,978			$12,196
	Roads (large)		$71,300 + variable costs	$85,278			$17,056
Utility Lines	Outfall structures and pipelines	per project	$101,000	$101,000	8 years	100% over 8 years	$12,625

Table 4-8
Summary of Activity Cost Estimation

Activity	Sub-activity	Cost Unit	Midpoint Cost Estimate	Present Value of Cost Stream	Forecast Period	Likelihood of Modifications	Annual Expected Cost
Instream Activities	Dredging	per project	$821,000	$821,000	Annual	100%	$821,000
	Boat dock, boat ramps, bank stabilization	per project	$54,500	$54,500	Annual	100%	$54,500
EPA Water Quality Temperature Compliance	Minor facility	per facility	O&M: $6,800 for 20 years	$72,039	Immediate	20%	$1,360
	Major facility	per facility	Capital: $421,500 O&M: $19,725 for 20 years	$630,467	Immediate	25%	$14,878
Sand and Gravel Mining	Mining on non-Federal lands	per site	$330,000 for 5 years	$1,353,065	30 years	50% over 30 years	$22,551
Residential and Commercial Development	New development	per project	$235,000	$235,000	20 years	100% over 20 years	$11,750

*Data for hydropower dams do not allow us to allocate all costs over an expenditure period. The cost stream presented is the present value of costs.
**Transportation costs are presented for a project of average mileage (3.2 miles).

Section 5
The Economic Impacts of Critical Habitat Designation

5.1 Introduction

In this section, we present a summary of the economic impacts of critical habitat designation for each of the 13 ESUs of Pacific salmon and O. mykiss. Because of the large numbers of watersheds and nearshore areas that constitute the particular areas , the results are summarized by showing their range and other summary statistics for each ESU.

Below, we first discuss the aggregation of individual activity impacts into a total impact for each area, and some qualifications on the results. We then examine two different ways of grouping types of impacts that provide useful economic information to the exclusion process. For each ESU, we then present a summary of the results. The full set of results is given in a series of appendices. Finally, we present results for all 13 ESUs combined.

As noted before, the 4(b)(2) exclusion process operates at the level of a particular watershed, not at the level of the designation as a whole. For that reason, the variation of impacts across areas is an important factor in conducting that process. To illustrate this variation, we present a series of figures which identify which areas fall into a different impact categories. These categories are for illustrative purposes only, however, as the 4(b)(2) procedure used the impact estimate, not the category. The figures are presented in the Map Appendix.

5.2 Aggregating Impacts Up to the Watershed Level

As noted in Section 2 of the report, the ideal measure of the economic impact of a regulatory action is the change in economic surplus that occurs as the result of the action. Using this measure is not feasible in this case, as the economic models and data to populate those models are not available. Instead, we chose a straightforward "unit-cost" approach to estimate the aggregate impacts for each watershed. Using the spatial data described in Section 4 above, we estimated the annual volume of an activity type in a particular area. Where an activity has different sub-types or scales, a separate volume was estimated for each. We then used the annual expected modification cost to calculate the economic impact of critical habitat designation for a particular area, using the following formula:

$$\text{Aggregate Annual Impact for Watershed (\$/yr)} = \text{Sum (over all Activity Types)} \left[\text{Volume of Activity Type} \times \text{Per-project Impact Cost} \right]$$

Two important elements of this estimation warrant closer examination: variation in the discount rate and uncertainty over nominal modification costs. We considered both of these in the following ways. First, using the guidance from OMB (OMB 2003), we substituted a 3% discount rate for the 7% discount rate used in the base case calculations. Second, using the ranges of nominal modification costs (where available) described in Section 4 and Appendix D, we estimated a Low and High case for the annualized expected per-unit costs. For both cases, we substituted the estimate into the equation above.[1] This produced six cases, using the two discount rates (7% and 3%) and three nominal cost estimates (Midpoint, High, and Low).

Although we use the high and low ends of the nominal cost range to produce an upper and lower bound for the aggregate costs, the probability that these bounds will be reached is vanishingly small. The range is not produced by true, uniform uncertainty over the cost estimate. If the cost estimate was distributed in this way, the probability of the true cost being equal to the high or low end of the range would be equal to the probability of it being equal to the midpoint of the range, which we chose for the base case. Instead, the range is produced by variation in the underlying determinants of modification costs, such as project location, scale, history, and so forth. The cost of an individual project's modifications may in fact reach the upper or lower bound, but only in a small fraction of the cases. For the upper and lower bounds of the aggregate impact costs to be reached, it would have to be that every project has the characteristics necessary to reach the upper or lower bound on an individual basis, which we know is not the case. Nevertheless, we present this information to illustrate how variation in the underlying nominal costs produces variation in the estimates of aggregate impacts for a particular area.

Another aspect of the aggregation method that warrants comment is the implicit assumption that there are no cumulative or regional effects. We do not provide alternative estimations in this case, however, for the reason stated previously: Adequate data are not available to support the models and analysis needed to examine such effects. Nevertheless, it is important to discuss the possible limitations this assumption places on the analysis.

The use of a constant per-unit cost is best suited to a situation in which the impacts of a regulation are "small": that is, one in which the accumulation of areas or entities that fall under the regulation do not change either the aggregate level of activity or the per-unit cost itself. At first glance, looking ahead to the results presented later in this section, this would not seem to be the case for the impacts of critical habitat designation for Pacific salmon and O. mykiss. Yet the magnitudes of the impacts alone do not necessarily imply that the simpler per-unit approach is inappropriate. Two other factors are more determinative: the concentration of the impacts in terms of the industries and markets affected, and the practicality of using more sophisticated models to gauge the cumulative impacts at a regional scale. We have noted previously that the second factor works against examining cumulative impacts. The first factor reinforces this conclusion.

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1. We have not considered uncertainty over the estimated volume of projects. The use of spatial data and the projection methods we have chosen do not allow us to derive a range analytically.

Using sophisticated models such as input-output models or estimations of changes in economic surplus require a clear, quantifiable link between the regulation and a change in the availability or cost of a set of economic goods and services. In some previous analyses of critical habitat designation, such a link existed (or was at least assumed to exist). In the case of the northern spotted owl, for example, the economic analysis attributed a precise percentage reduction in federal timber harvest in certain areas to critical habitat designation (Schamberger et al. 1992). This assumption allowed the analysis to estimate the impacts of the designation on regional levels of employment and county tax revenues.

Specifying the link between critical habitat designation and a change in an economic good or service so precisely is not possible for the Pacific salmon and O. mykiss designations. In the Initial Regulatory Flexibility Analysis for this rulemaking, NOAA Fisheries discusses the impacts of the designations on small entities. In that report, we identify a set of links between the different types of activities identified here and different industry groups that may bear the cost of some of the impacts to those activities. These links are presented in Table 5-1.

In some cases, the link between the activity and an industry is direct and quantifiable. For example, the link between hydropower dams and power markets is one that could be incorporated into a broader regional study. Working against this possibility, however, are the large number of dams and the need to document certain modifications (*e.g.*, changes in flow) on an individual basis, when these modifications are highly uncertain prospectively. Thus, the data needed to support such an effort are not available even in this case.

In other cases, the links are less direct and harder to quantify. Modifications to transportation, utility lines, and instream activities, for example, affect firms that either own the affected assets or are hired to build, maintain, or modify them, but the modifications do not directly affect the flow of a given input or output. In cases like these, data to identify and quantify the links from the impacted activities to market inputs or outputs are not available, and so assessing the impacts at a regional level would be tantamount to a simulation exercise.

This leaves us with uncertainty over the presence of any potential bias from the decision not to consider cumulative impacts at the regional level. On the one hand, if these impacts in fact exist, the direction of the bias in our results is downward, in that we have underestimated the costs of critical habitat designation at the level of the ESU. On the other hand, there are other potential sources of bias that would produce an overestimate of the impact costs, as we have discussed in several instances above and in greater detail in Appendix D . The aggregate direction of these potential biases is therefore unknown.

Table 5-1 Industry Groups and Critical Habitat Designation Impacts	
Type of Activity Impacted by Critical Habitat Designation	**Industry Groups associated with Impacted Activity**
Hydropower dams	Hydroelectric power generation NAICS 22111
Non-hydropower dams	Water Supply and Irrigation Systems NAICS 22131
Federal lands management	Forestry and Logging NAICS 113
Grazing	Beef Cattle Ranching & Farming NAICS 112111
Transportation	Highway, Street, and Bridge Construction NAICS 237310
Utility lines	Electric Services NAICS 2211
	Natural Gas Distribution NAICS 221210
	Sewage Treatment Facilities NAICS 221320
Instream activities	Construction-General, Water, Sewer, Pipeline, Communication & Powerline Construction NAICS 237110, 237120, 237130
	Marinas NAICS 713930
Dredging	Heavy Construction SIC 1629
NPDES-permitted activities	Fishing, Hunting, Trapping NAICS 114
	Food and Kindred Products NAICS 311
	Sewage Services NAICS 221320
	Paper Mills NAICS 322121, 322122
	Pulp Mills NAICS 322110
	Lumber and Wood Products NAICS 321
Sand & gravel mining	Construction Sand and Gravel Mining NAICS 212321
Development	Subdividers and Developers SIC 6552

There is no evidence, of course, that cumulative impacts are present in significant amounts. This absence of evidence is not evidence that they do not exist, but it does suggest that attempting to document these effects, given the analytical barriers, is of questionable value. We note, then, that the absence of this analysis possibly biases the results downward, although there is no way to gauge the likelihood or magnitude of this potential bias.

5.3 Differentiating Types of Impacts

In addition to estimating the total impact of critical habitat designation for each watershed, we also used two different methods for grouping activity types. The first differentiates activity types by the degree to which the modification costs will be borne locally or in a broader area. This grouping is useful for discerning the possibility that critical habitat designation may impose an inequitable burden on individual watersheds. The second grouping differentiates activity types by their probable location within certain watersheds that serve as major migratory corridors. In these cases, NOAA Fisheries is considering the migratory and non-migratory (that is, tributary) areas separately, and the second grouping is intended to support that consideration.

When analyzing the costs of designating a particular area as critical habitat, the standard approach is to consider the impacts from a national perspective, in that the location and concentration of the impacts does not influence economic efficiency.[2] The location and concentration of impacts may in part determine the equity of the regulation, however. To support consideration of this issue, we divided the set of activity types into two types: those likely to have economic impacts locally and those likely to have economic impacts at a broader geographic scale.[3] For each activity, we judged the extent to which employment would be drawn from local labor markets and output would be consumed locally, and the extent to which the entity affected was local or non-local in nature. This division is presented in Table 5-2.

The most logical candidates for non-local impacts are hydropower dams (for which the impact may be absorbed in the broader market for electricity), transportation projects (which are most often funded at the federal or state level), and federal lands management (which is funded at the federal level). We do not assume that the impacts of all projects within these categories are felt non-locally, only that as a category they are more likely to produce that result.

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2. This approach is recommended by OMB (2003) and EPA (2000).

3. This division was made using best professional judgment. We intend to refine this division and welcome comment on data and methods for doing so.

Table 5-2 Activity Types with Local and Non-Local Impact	
Local Impact Activity Types	**Non-local Impact Activity Types**
Non-hydropower dams Grazing Utility lines Instream activities Dredging NPDES-permitted activities Sand & gravel mining Development	Hydropower dams Federal lands management Transportation

The second type of grouping categorized activity types by the location of the activity within the watershed.[4] NOAA Fisheries is considering the designation of only the migratory corridor within a watershed and the exclusion of the tributary areas. If this course is followed, only a portion of the estimated impacts (that is, those associated with the migratory corridor) would be attributable to critical habitat designation. The original estimation of the location of activity types did not differentiate the location within a watershed, however. Similar to our approach above, we identified types of activities that were more likely to be located along migratory corridors.[5] In this case, we considered what types of activities were unlikely to occur in large, mainstem rivers. We also drew on discussions with NWR biologists familiar with section 7 consultations. Again, the division is categorical, which presumes a higher likelihood of being present in one area or another, but not a certainty. Table 5-3 presents the migratory and tributary grouping of activities.

Table 5-3 Activity Types and Location	
Activity Types located in tributary areas	**Activity Types located in migratory corridors**
Non-hydropower dams Federal lands management Grazing Transportation Mining Development	Hydropower dams Instream activities Dredging Utility lines NPDES-permitted activities

4. Nearshore areas are not included.

5. This division was made using best professional judgment. We intend to refine this division and welcome comment on data and methods for doing so.

5.4 Summary of the Results for 13 Pacific Salmon and O. mykiss ESUs

Below, for each ESU, we present a brief narrative covering the results for that ESU, followed by a series of tables.[6] Our emphasis is on illustrating the variation in the impact of section 7 and critical habitat designation for individual watersheds in each ESU. As has been noted many times, the number of particular areas considered in the report is quite large, making a detailed discussion of each area's result impractical.[7] Our summary includes several important aspects of the results, including

1) The total impact of the designation for the ESU;
2) The distribution across activity types of the total impact for the ESU;
3) The average, median, maximum, and minimum total impact for the individual watersheds in an ESU, both annually and as a present value over a 20-year period[8]; and the sensitivity of the total impacts to variation in cost estimates and discount rates;
4) The frequency of annual total impacts by cost category for individual watersheds in an ESU.

For most of these, we list the results for each of the six cases we have described above, with High/Mid/Low referring to the three per-project cost estimates, and 7%/3% referring to the two discount rates.

We also illustrate the total impacts at the individual watershed level by presenting a series of maps that display the impacts as categories of cost levels.[9] We have chosen the impact categories to illustrate the variation in impacts at the watershed level across each ESU. These categories were not used in the 4(b)(2) process, as their choice would be arbitrary given the continuous nature of the impact estimates.

Lastly, we emphasize that the impacts listed in these tables stem from the implementation of section 7 for activities that modify habitat, not just the incremental impacts of critical habitat designation alone. As noted above, the NMCA decision called for an analysis of "all of the economic impacts

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6. An area that is not included in this summary is the Columbia River mouth, which does not constitute either a HUC5 watershed or a nearshore marine area. This area is included as a migratory corridor for several ESUs. We have conducted a preliminary analysis of the economic impact of designating this area, which found the annual expected modification cost to range (depending on the discount rate) between $579,195 (3%) and $582,976 (7%).

7. Appendices F.1 to F.12 contain the full set of results for all watersheds, grouped by ESU. This set includes total, local and non-local, and migratory and tributary impacts for each of six cases (3 per-project cost estimates and 2 discount rates), as well as the individual activity cost estimates presented in the same way.

8. Because the data underlying the cost estimates varies widely in terms of the forecast period, the 20-year present value should be seen as illustrative.

9. These maps, Figures 15-28, are included in the Map Appendix.

of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes."[10] The estimates of impacts should then be interpreted as the sum of two types of impacts:

- Co-extensive impacts, or those that are associated with habitat-modifying actions covered by both the jeopardy and adverse modification standards; and
- Incremental impacts, or those that are solely attributable to critical habitat designation and would not occur without the designation.

10. New Mexico Cattle Growers' Association v. U.S. Fish and Wildlife Service, 248 F.3d 1277 (10th Cir. 2001).

5.4.1 Puget Sound chinook salmon ESU

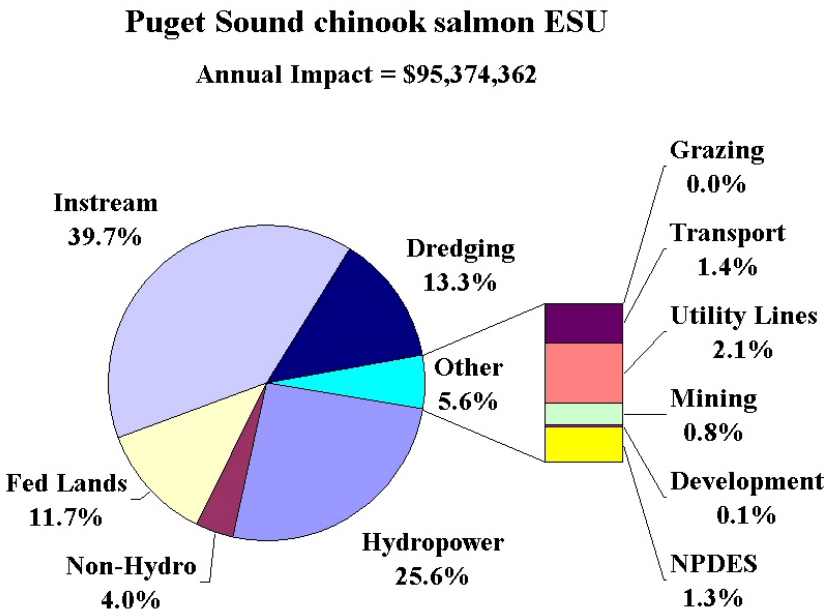
5.4.1.1 Watershed Characteristics

For this ESU, the analysis covers 80 watersheds, averaging 180.8 square miles in size and ranging from 69.9 to 338.1 square miles. The estimated total population for all watersheds in this ESU is 3,438,663 and the estimated total personal income is $125,615,440,000.

5.4.1.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$134,244,435	$1,521,740,579
Mid 7%	$95,374,362	$1,081,125,167
Low 7%	$56,504,290	$640,509,755
High 3%	$129,578,898	$1,985,641,005
Mid 3%	$90,708,825	$1,390,003,819
Low 3%	$51,838,753	$794,366,632

5.4.1.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.1.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $1,192,180.
- The highest annual total impact at the watershed level is $15,221,609 for Lake Washington, while the lowest is $1,360 for Lower Tucannon River.
- The activity with the highest impact is Instream Activities which averages $473,639 across all watersheds in this ESU and ranges from $0 to $12,902,875.
- The activity with the lowest impact is Grazing which averages $5 across all watersheds in this ESU and ranges from $0 to $72.
- 24 watersheds have annual total impacts of more than $1 million, while 2 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$1,678,055	$974,387	$23,371,294	$2,720
Mid 7%	$1,192,180	$637,788	$15,221,609	$1,360
Low 7%	$706,304	$307,874	$7,071,925	$0
High 3%	$1,619,736	$974,387	$23,371,294	$2,720
Mid 3%	$1,133,860	$636,356	$15,221,609	$1,360
Low 3%	$647,984	$306,442	$7,071,925	$0
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$19,021,757	$11,045,257	$264,927,525	$30,833
Mid 7%	$13,514,065	$7,229,703	$172,546,004	$15,416
Low 7%	$8,006,372	$3,489,933	$80,164,484	$0
High 3%	$24,820,513	$14,931,311	$358,137,008	$41,681
Mid 3%	$17,375,048	$9,751,388	$233,252,886	$20,840
Low 3%	$9,929,583	$4,695,855	$108,368,764	$0

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	32	32	10	10	6	6
$200,000 - $500,000	21	21	22	22	16	16
$500,000 - $1,000,000	16	17	24	24	20	20
$1,000,000 - $2,500,000	6	3	16	15	25	25
> $2,500,000	5	7	8	9	13	13

5.4.2 Lower Columbia River chinook salmon ESU

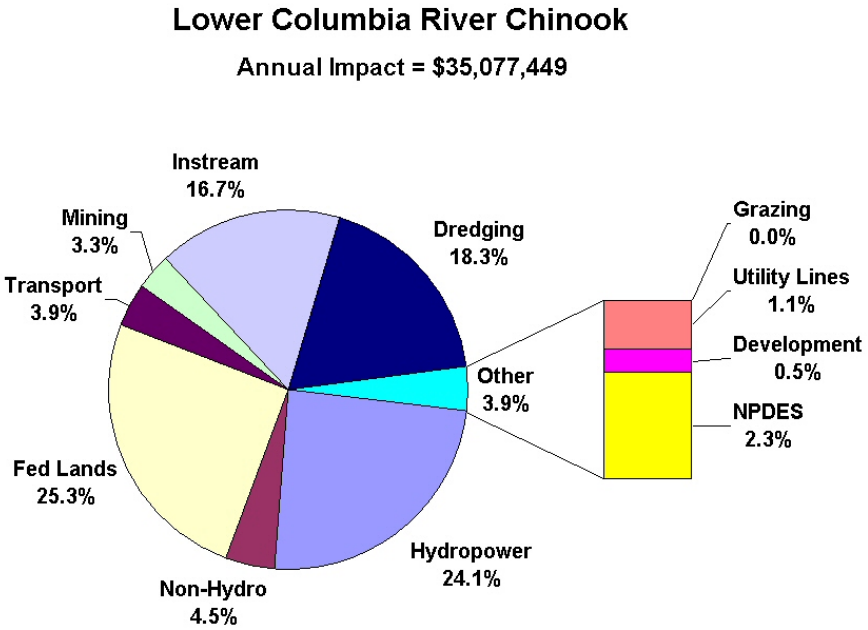
5.4.2.1 Watershed Characteristics

For this ESU, the analysis covers 47 watersheds, averaging 160.6 square miles in size and ranging from 49.2 to 391.8 square miles. The estimated total population for all watersheds in this ESU is 1,475,800 and the estimated total personal income is $46,014,973,000.

5.4.2.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$49,518,289	$561,319,278
Mid 7%	$35,077,449	$397,623,768
Low 7%	$20,636,610	$233,928,258
High 3%	$48,656,311	$745,599,528
Mid 3%	$34,215,471	$524,311,007
Low 3%	$19,774,632	$303,022,486

5.4.2.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.2.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $746,329.
- The highest annual total impact at the watershed level is $3,918,463 for Salmon Creek, while the lowest is $34,120 for Clatskanie River.
- The activity with the highest impact is Federal Lands which averages $188,953 across all watersheds in this ESU and ranges from $0 to $914,701.
- The activity with the lowest impact is Grazing which averages $10 across all watersheds in this ESU and ranges from $0 to $86.
- 8 watersheds have annual total impacts of more than $1 million, while 1 has annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$1,053,581	$720,828	$6,002,599	$53,573
Mid 7%	$746,329	$549,672	$3,918,463	$34,120
Low 7%	$439,077	$230,643	$2,981,652	$12,745
High 3%	$1,035,241	$642,528	$5,988,281	$53,573
Mid 3%	$727,989	$507,257	$3,904,144	$34,120
Low 3%	$420,737	$230,643	$2,413,913	$12,745

	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$11,942,963	$8,171,012	$68,043,038	$607,280
Mid 7%	$8,460,080	$6,230,863	$44,418,113	$386,773
Low 7%	$4,977,197	$2,614,474	$33,798,795	$144,478
High 3%	$15,863,820	$9,845,966	$91,763,207	$820,940
Mid 3%	$11,155,553	$7,773,097	$59,826,322	$522,851
Low 3%	$6,447,287	$3,534,325	$36,990,321	$195,309

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	21	21	11	11	6	6
$200,000 - $500,000	17	17	12	12	10	10
$500,000 - $1,000,000	3	3	17	16	16	17
$1,000,000 - $2,500,000	6	5	4	5	11	9
> $2,500,000	0	1	3	3	4	5

5.4.3 Upper Willamette River chinook salmon ESU

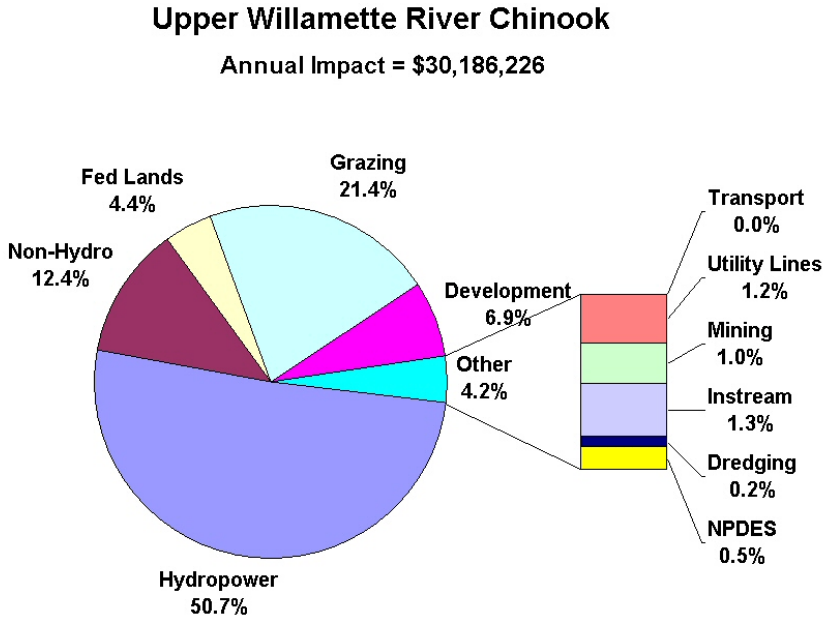
5.4.3.1 Watershed Characteristics

For this ESU, the analysis covers 58 watersheds, averaging 164.8 square miles in size and ranging from 53.3 to 411.2 square miles. The estimated total population for all watersheds in this ESU is 1,791,854 and the estimated total personal income is $52,491,827,000.

5.4.3.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$42,644,380	$483,399,429
Mid 7%	$30,186,226	$342,178,841
Low 7%	$17,728,072	$200,958,252
High 3%	$40,720,112	$623,986,812
Mid 3%	$28,261,958	$433,080,567
Low 3%	$15,803,804	$242,174,321

5.4.3.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.3.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $520,452.
- The highest annual total impact at the watershed level is $4,633,402 for Upper Mckenzie River, while the lowest is $4,019 for South Santiam River / Foster Reservoir.
- The activity with the highest impact is Federal Lands which averages $219,659 across all watersheds in this ESU and ranges from $0 to $1,314,149.
- The activity with the lowest impact is Grazing which averages $11 across all watersheds in this ESU and ranges from $0 to $124.
- 5 watersheds have annual total impacts of more than $1 million, while 3 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$735,248	$472,120	$5,339,487	$6,648
Mid 7%	$520,452	$287,441	$4,633,402	$4,019
Low 7%	$305,656	$133,976	$4,004,503	$1,389
High 3%	$702,071	$469,256	$5,325,168	$6,648
Mid 3%	$487,275	$286,009	$3,741,458	$4,019
Low 3%	$272,479	$133,976	$3,112,559	$1,389

	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$8,334,473	$5,351,761	$60,526,268	$75,363
Mid 7%	$5,899,635	$3,258,317	$52,522,369	$45,555
Low 7%	$3,464,797	$1,518,694	$45,393,425	$15,747
High 3%	$10,758,393	$7,190,787	$81,601,811	$101,878
Mid 3%	$7,466,906	$4,382,749	$57,333,354	$61,582
Low 3%	$4,175,419	$2,053,017	$47,696,234	$21,287

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	35	35	23	23	17	17
$200,000 - $500,000	18	18	15	15	13	14
$500,000 - $1,000,000	2	2	16	15	17	16
$1,000,000 - $2,500,000	2	1	2	2	8	8
> $2,500,000	1	2	2	3	3	3

5.4.4 Upper Columbia River spring-run chinook salmon ESU

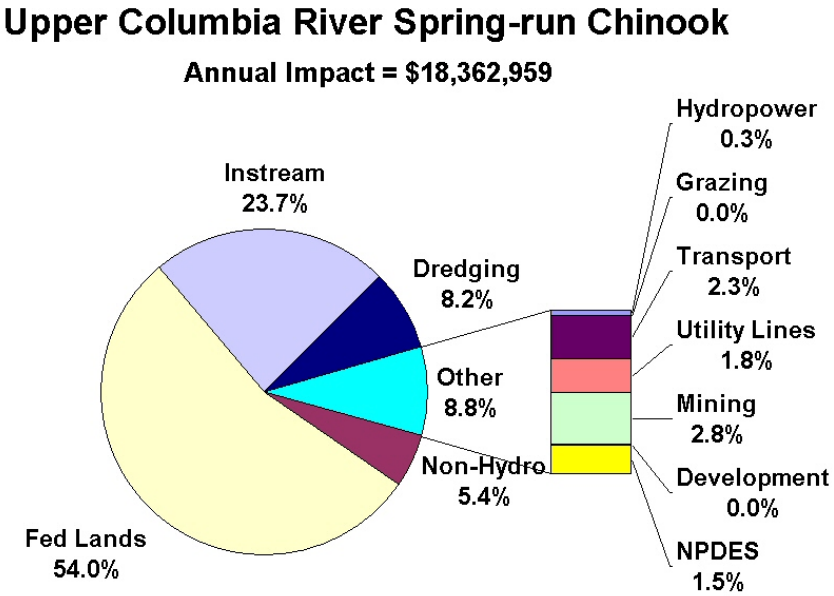
5.4.4.1 Watershed Characteristics

For this ESU, the analysis covers 30 watersheds, averaging 257.7 square miles in size and ranging from 132.1 to 489.1 square miles. The estimated total population for all watersheds in this ESU is 265,185 and the estimated total personal income is $6,321,621,000.

5.4.4.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$28,145,301	$319,043,740
Mid 7%	$18,362,959	$208,155,066
Low 7%	$8,580,616	$97,266,393
High 3%	$28,125,254	$430,985,748
Mid 3%	$18,342,912	$281,083,099
Low 3%	$8,560,570	$131,180,450

5.4.4.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.4.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $612,099.
- The highest annual total impact at the watershed level is $2,611,595 for Lake Entiat, while the lowest is $19,723 for Upper Lake Umatilla.
- The activity with the highest impact is Federal Lands which averages $330,320 across all watersheds in this ESU and ranges from $383 to $1,334,903.
- The activity with the lowest impact is Grazing which averages $16 across all watersheds in this ESU and ranges from $0 to $51.
- 6 watersheds have annual total impacts of more than $1 million, while 2 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$938,177	$766,800	$4,140,477	$36,845
Mid 7%	$612,099	$486,445	$2,611,595	$19,723
Low 7%	$286,021	$205,137	$1,082,713	$2,601
High 3%	$937,508	$763,936	$4,134,749	$36,845
Mid 3%	$611,430	$483,581	$2,605,867	$19,723
Low 3%	$285,352	$205,137	$1,076,986	$2,601
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$10,634,791	$8,692,131	$46,934,772	$417,664
Mid 7%	$6,938,502	$5,514,140	$29,603,985	$223,575
Low 7%	$3,242,213	$2,325,355	$12,273,198	$29,487
High 3%	$14,366,192	$11,706,401	$63,360,069	$564,610
Mid 3%	$9,369,437	$7,410,296	$39,931,790	$302,236
Low 3%	$4,372,682	$3,143,484	$16,503,510	$39,861

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	15	15	5	5	4	4
$200,000 - $500,000	11	11	11	11	4	4
$500,000 - $1,000,000	3	3	8	8	12	12
$1,000,000 - $2,500,000	1	1	5	5	8	8
> $2,500,000	0	0	1	1	2	2

5.4.5 Oregon Coast coho salmon ESU

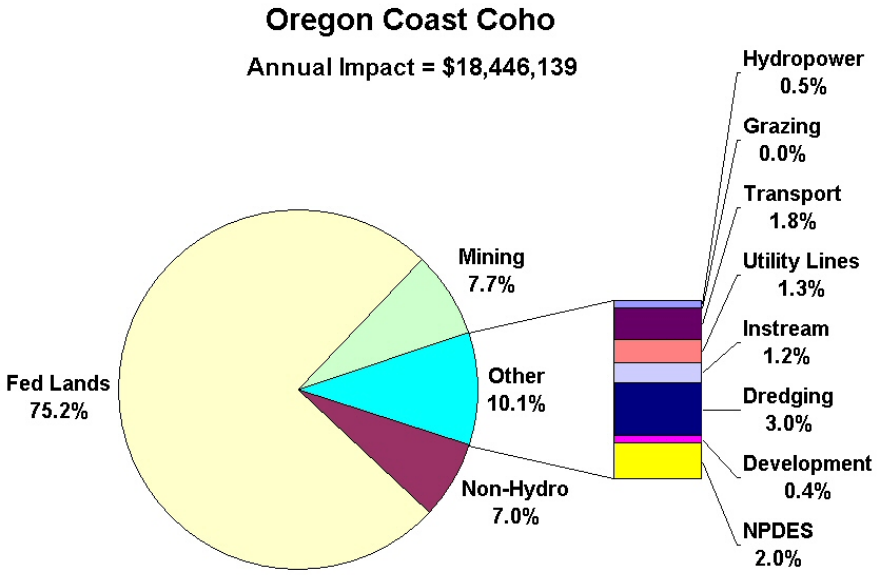
5.4.5.1 Watershed Characteristics

For this ESU, the analysis covers 80 watersheds, averaging 130.5 square miles in size and ranging from 16.7 to 308.2 square miles. The estimated total population for all watersheds in this ESU is 266,690 and the estimated total personal income is $6,135,714,000.

5.4.5.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$28,464,568	$322,662,816
Mid 7%	$18,446,139	$209,097,966
Low 7%	$8,427,710	$95,533,115
High 3%	$28,435,930	$435,746,472
Mid 3%	$18,417,501	$282,226,085
Low 3%	$8,399,072	$128,705,699

5.4.5.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.5.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $230,577.
- The highest annual total impact at the watershed level is $684,634 for Middle North Umpqua, while the lowest is $0 for Millicoma River.
- The activity with the highest impact is Federal Lands which averages $173,473 across all watersheds in this ESU and ranges from $0 to $666,576.
- The activity with the lowest impact is Grazing which averages $10 across all watersheds in this ESU and ranges from $0 to $86.
- 0 watersheds have annual total impacts of more than $1 million, while 14 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$355,807	$277,315	$1,082,401	$0
Mid 7%	$230,577	$183,839	$684,634	$0
Low 7%	$105,346	$82,152	$366,275	$0
High 3%	$355,449	$275,884	$1,070,946	$0
Mid 3%	$230,219	$182,407	$684,634	$0
Low 3%	$104,988	$82,152	$366,275	$0
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$4,033,285	$3,143,536	$12,269,658	$0
Mid 7%	$2,613,725	$2,083,926	$7,760,732	$0
Low 7%	$1,194,164	$931,244	$4,151,941	$0
High 3%	$5,446,831	$4,227,585	$16,410,956	$0
Mid 3%	$3,527,826	$2,795,172	$10,491,192	$0
Low 3%	$1,608,821	$1,258,884	$5,612,720	$0

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	68	68	46	46	29	29
$200,000 - $500,000	12	12	24	24	29	29
$500,000 - $1,000,000	0	0	10	10	20	20
$1,000,000 - $2,500,000	0	0	0	0	2	2
> $2,500,000	0	0	0	0	0	0

5.4.6 Hood Canal summer-run chum salmon ESU

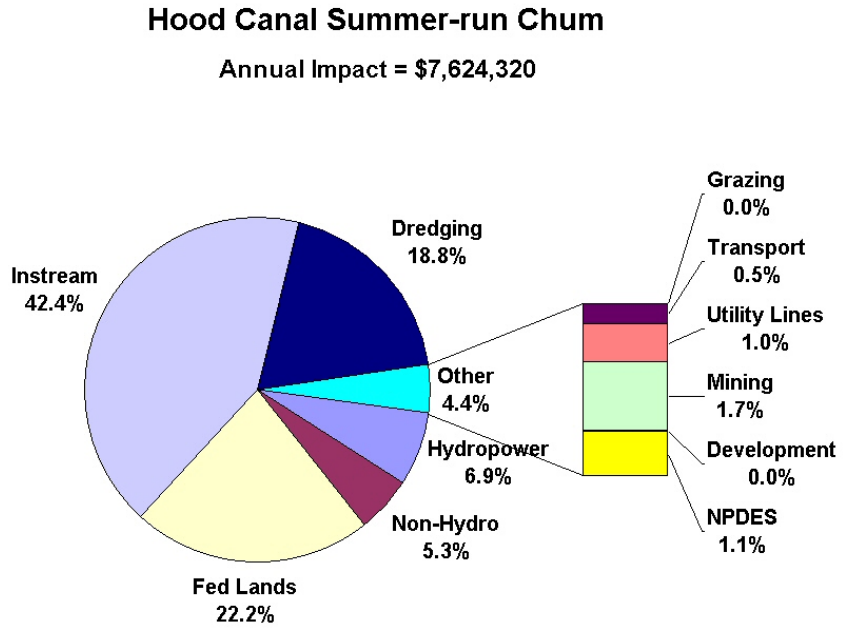
5.4.6.1 Watershed Characteristics

For this ESU, the analysis covers 17 watersheds, averaging 120.6 square miles in size and ranging from 53.0 to 244.6 square miles. The estimated total population for all watersheds in this ESU is 79,425 and the estimated total personal income is $2,042,304,000.

5.4.6.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$11,655,507	$132,122,108
Mid 7%	$7,624,320	$86,426,208
Low 7%	$3,593,134	$40,730,307
High 3%	$11,655,507	$178,606,645
Mid 3%	$7,624,320	$116,833,551
Low 3%	$3,593,134	$55,060,456

5.4.6.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.6.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $448,489.
- The highest annual total impact at the watershed level is $1,452,160 for nearshore area #18, while the lowest is $83,174 for Sequim Bay.
- The activity with the highest impact is Instream Activities which averages $189,949 across all watersheds in this ESU and ranges from $0 to $1,008,250.
- The activity with the lowest impact is Grazing which averages $0 across all watersheds in this ESU and ranges from $0 to $0.
- 1 watershed has annual total impacts of more than $1 million, while none has annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$685,618	$413,853	$2,250,820	$120,194
Mid 7%	$448,489	$263,891	$1,452,160	$83,174
Low 7%	$211,361	$129,425	$746,109	$44,477
High 3%	$685,618	$413,853	$2,250,820	$120,194
Mid 3%	$448,489	$263,891	$1,452,160	$83,174
Low 3%	$211,361	$129,425	$746,109	$44,477

	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$7,771,889	$4,691,272	$25,514,384	$1,362,472
Mid 7%	$5,083,895	$2,991,361	$16,461,098	$942,830
Low 7%	$2,395,900	$1,467,113	$8,457,595	$504,176
High 3%	$10,506,273	$6,341,803	$34,491,114	$1,841,831
Mid 3%	$6,872,562	$4,043,812	$22,252,608	$1,274,546
Low 3%	$3,238,850	$1,983,288	$11,433,231	$681,560

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	12	12	6	6	5	5
$200,000 - $500,000	3	3	5	5	4	4
$500,000 - $1,000,000	2	2	5	5	4	4
$1,000,000 - $2,500,000	0	0	1	1	4	4
> $2,500,000	0	0	0	0	0	0

5.4.7 Columbia River chum salmon ESU

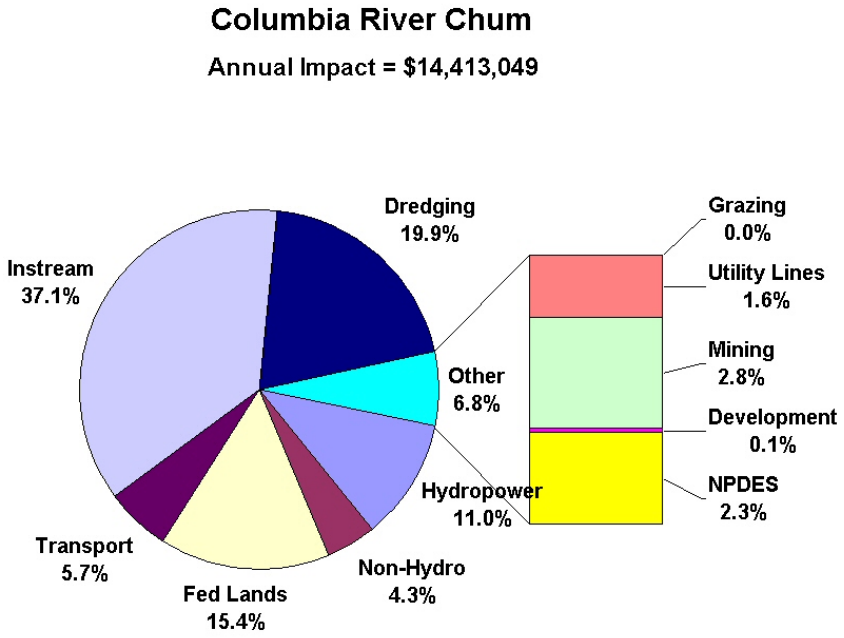
5.4.7.1 Watershed Characteristics

For this ESU, the analysis covers 19 watersheds, averaging 191.2 square miles in size and ranging from 116.4 to 391.8 square miles. The estimated total population for all watersheds in this ESU is 484,322 and the estimated total personal income is $13,298,604,000.

5.4.7.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$21,301,109	$241,460,754
Mid 7%	$14,413,049	$163,380,490
Low 7%	$7,524,989	$85,300,226
High 3%	$20,630,258	$316,133,930
Mid 3%	$13,742,198	$210,582,676
Low 3%	$6,854,137	$105,031,423

5.4.7.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.7.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $758,582.
- The highest annual total impact at the watershed level is $3,918,463 for Salmon Creek, while the lowest is $50,552 for South Fork Toutle River.
- The activity with the highest impact is Instream Activities which averages $281,105 across all watersheds in this ESU and ranges from $0 to $1,812,125.
- The activity with the lowest impact is Grazing which averages $5 across all watersheds in this ESU and ranges from $0 to $62.
- 3 watersheds have annual total impacts of more than $1 million, while none has annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$1,121,111	$593,930	$6,002,599	$74,692
Mid 7%	$758,582	$374,003	$3,918,463	$50,552
Low 7%	$396,052	$171,547	$1,899,042	$12,745
High 3%	$1,085,803	$593,930	$5,988,281	$74,692
Mid 3%	$723,274	$371,139	$3,904,144	$50,552
Low 3%	$360,744	$171,547	$1,820,008	$12,745
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$12,708,461	$6,732,550	$68,043,038	$846,676
Mid 7%	$8,598,973	$4,239,550	$44,418,113	$573,037
Low 7%	$4,489,486	$1,944,584	$21,526,766	$144,478
High 3%	$16,638,628	$9,101,264	$91,763,207	$1,144,562
Mid 3%	$11,083,299	$5,687,267	$59,826,322	$774,649
Low 3%	$5,527,970	$2,628,747	$27,889,436	$195,309

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	11	11	3	3	3	3
$200,000 - $500,000	5	5	8	8	3	3
$500,000 - $1,000,000	1	1	5	5	8	8
$1,000,000 - $2,500,000	2	2	2	2	3	2
> $2,500,000	0	0	1	1	2	3

5.4.8 Ozette Lake sockeye salmon ESU

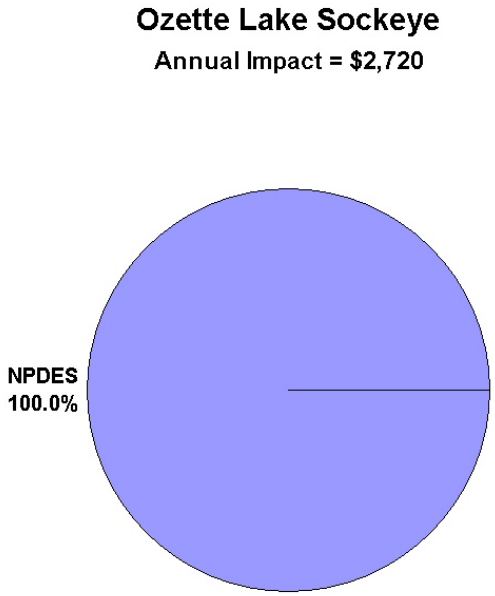
5.4.8.1 Watershed Characteristics

For this ESU, the analysis covers 1 watershed, which is 101.0 square miles in size. The estimated total population for the watershed in this ESU is 85 and the estimated total personal income is $2,092,000.

5.4.8.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$5,440	$61,666
Mid 7%	$2,720	$30,833
Low 7%	$0	$0
High 3%	$5,440	$83,361
Mid 3%	$2,720	$41,681
Low 3%	$0	$0

5.4.8.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.8.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The annual total impact at the watershed level is $2,720.
- Because there is only one watershed, we do not report maximum and minium figures.
- The activity with the highest impact is NPDES which accounted for $2,720 of the total impact.
- The activity with the lowest impact is Hydro dams (and other activities), which averages $0 for the watershed in this ESU.
- 0 watersheds have annual total impacts of more than $1 million, while 1 has annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$5,440	$5,440	$5,440	$5,440
Mid 7%	$2,720	$2,720	$2,720	$2,720
Low 7%	$0	$0	$0	$0
High 3%	$5,440	$5,440	$5,440	$5,440
Mid 3%	$2,720	$2,720	$2,720	$2,720
Low 3%	$0	$0	$0	$0

	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$61,666	$61,666	$61,666	$61,666
Mid 7%	$30,833	$30,833	$30,833	$30,833
Low 7%	$0	$0	$0	$0
High 3%	$83,361	$83,361	$83,361	$83,361
Mid 3%	$41,681	$41,681	$41,681	$41,681
Low 3%	$0	$0	$0	$0

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	1	1	1	1	1	1
$200,000 - $500,000	0	0	0	0	0	0
$500,000 - $1,000,000	0	0	0	0	0	0
$1,000,000 - $2,500,000	0	0	0	0	0	0
> $2,500,000	0	0	0	0	0	0

5.4.9 Upper Columbia River O. mykiss ESU

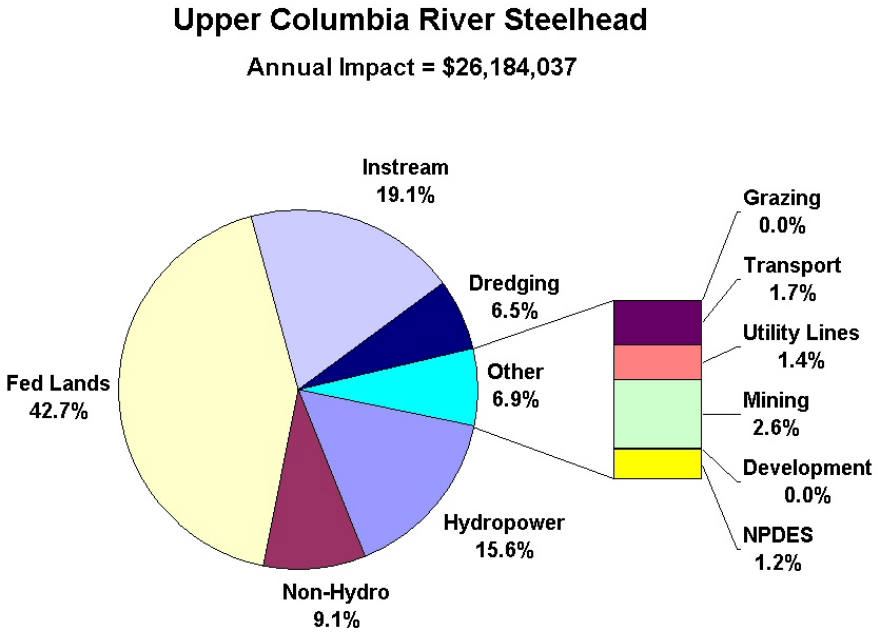
5.4.9.1 Watershed Characteristics

For this ESU, the analysis covers 41 watersheds, averaging 265.2 square miles in size and ranging from 68.4 to 489.1 square miles. The estimated total population for all watersheds in this ESU is 310,216 and the estimated total personal income is $7,268,925,000.

5.4.9.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$46,675,540	$529,095,034
Mid 7%	$33,906,543	$384,350,843
Low 7%	$21,137,545	$239,606,652
High 3%	$45,666,986	$699,791,716
Mid 3%	$32,897,988	$504,122,159
Low 3%	$20,128,990	$308,452,602

5.4.9.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.9.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $638,635.
- The highest annual total impact at the watershed level is $4,671,935 for Lower Chelan, while the lowest is $19,723 for Upper Lake Umatilla.
- The activity with the highest impact is Federal Lands which averages $272,868 across all watersheds in this ESU and ranges from $383 to $1,334,903.
- The activity with the lowest impact is Grazing which averages $18 across all watersheds in this ESU and ranges from $0 to $67.
- 7 watersheds have annual total impacts of more than $1 million, while 2 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$942,987	$713,730	$5,004,532	$36,845
Mid 7%	$638,635	$472,951	$4,671,935	$19,723
Low 7%	$334,283	$164,396	$4,339,339	$2,601
High 3%	$905,919	$713,730	$4,134,749	$36,845
Mid 3%	$601,568	$472,951	$3,172,218	$19,723
Low 3%	$297,216	$164,396	$2,839,622	$2,601
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$10,689,316	$8,090,554	$56,729,344	$417,664
Mid 7%	$7,239,308	$5,361,178	$52,959,166	$223,575
Low 7%	$3,789,300	$1,863,527	$49,188,989	$29,487
High 3%	$13,882,126	$10,937,055	$63,360,069	$564,610
Mid 3%	$9,218,302	$7,247,402	$48,610,431	$302,236
Low 3%	$4,554,477	$2,519,171	$43,513,791	$39,861

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	25	25	10	10	8	8
$200,000 - $500,000	11	11	13	13	5	5
$500,000 - $1,000,000	3	3	11	11	16	16
$1,000,000 - $2,500,000	1	1	5	5	9	9
> $2,500,000	1	1	2	2	3	3

5.4.10 Snake River Basin O. mykiss ESU

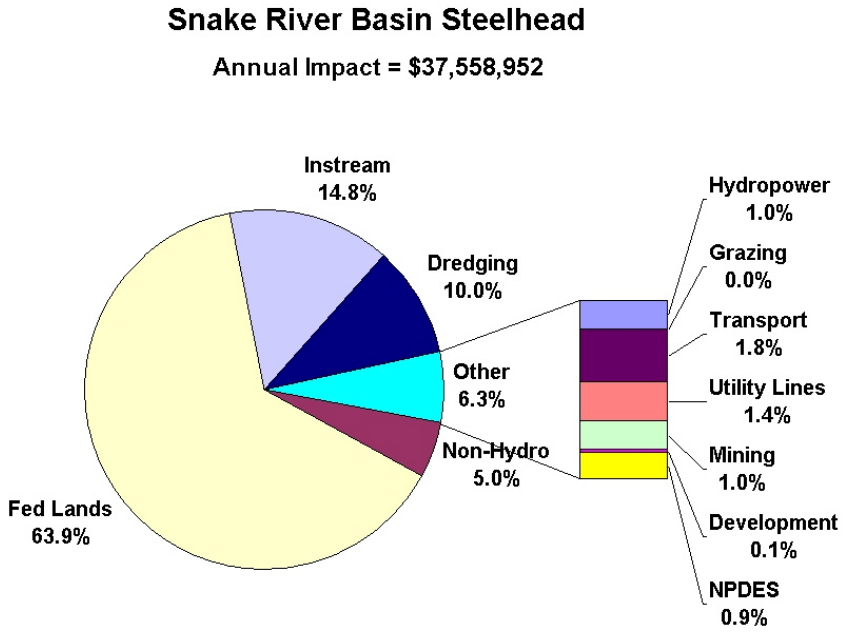
5.4.10.1 Watershed Characteristics

For this ESU, the analysis covers 287 watersheds, averaging 104.3 square miles in size and ranging from 2.5 to 325.9 square miles. The estimated total population for all watersheds in this ESU is 299,855 and the estimated total personal income is $7,068,023,000.

5.4.10.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$56,438,758	$639,766,917
Mid 7%	$37,371,660	$423,630,014
Low 7%	$18,304,562	$207,493,111
High 3%	$56,410,120	$864,417,347
Mid 3%	$37,343,022	$572,236,971
Low 3%	$18,275,924	$280,056,595

5.4.10.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.10.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $131,129.
- The highest annual total impact at the watershed level is $1,181,103 for Snake River/Captain John Creek, while the lowest is $0 for Deadman Creek.
- The activity with the highest impact is Federal Lands which averages $83,585 across all watersheds in this ESU and ranges from $0 to $1,077,817.
- The activity with the lowest impact is Grazing which averages $12 across all watersheds in this ESU and ranges from $0 to $83.
- 3 watersheds have annual total impacts of more than $1 million, while 82 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$198,031	$123,096	$1,870,604	$0
Mid 7%	$131,129	$83,800	$1,181,103	$0
Low 7%	$64,227	$42,845	$563,089	$0
High 3%	$197,930	$123,096	$1,870,604	$0
Mid 3%	$131,028	$83,800	$1,181,103	$0
Low 3%	$64,126	$41,988	$563,089	$0
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$2,244,796	$1,395,371	$21,204,407	$0
Mid 7%	$1,486,421	$949,923	$13,388,507	$0
Low 7%	$728,046	$485,674	$6,382,953	$0
High 3%	$3,033,043	$1,886,305	$28,664,756	$0
Mid 3%	$2,007,849	$1,284,134	$18,098,987	$0
Low 3%	$982,655	$643,410	$8,628,668	$0

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	272	272	240	240	207	207
$200,000 - $500,000	12	12	37	37	52	52
$500,000 - $1,000,000	1	1	5	5	20	20
$1,000,000 - $2,500,000	0	0	3	3	6	6
> $2,500,000	0	0	0	0	0	0

5.4.11 Lower Columbia River O. mykiss ESU

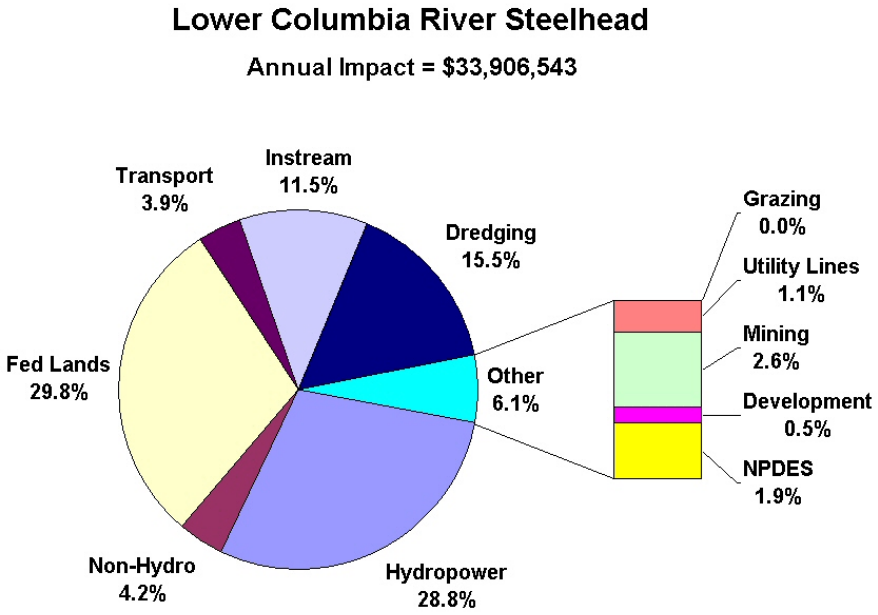
5.4.11.1 Watershed Characteristics

For this ESU, the analysis covers 41 watersheds, averaging 160.4 square miles in size and ranging from 53.4 to 274.3 square miles. The estimated total population for all watersheds in this ESU is 1,384,659 and the estimated total personal income is $43,827,919,000.

5.4.11.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$38,662,458	$438,261,974
Mid 7%	$26,184,037	$296,811,643
Low 7%	$13,705,616	$155,361,313
High 3%	$37,142,694	$569,167,182
Mid 3%	$24,664,273	$377,950,365
Low 3%	$12,185,852	$186,733,547

5.4.11.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.11.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $826,989.
- The highest annual total impact at the watershed level is $3,918,463 for Salmon Creek, while the lowest is $50,552 for South Fork Toutle River.
- The activity with the highest impact is Federal Lands which averages $246,854 across all watersheds in this ESU and ranges from $0 to $914,701.
- The activity with the lowest impact is Grazing which averages $9 across all watersheds in this ESU and ranges from $0 to $86.
- 8 watersheds have annual total impacts of more than $1 million, while none has annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$1,138,428	$823,559	$6,002,599	$74,692
Mid 7%	$826,989	$574,269	$3,918,463	$50,552
Low 7%	$515,550	$278,681	$2,981,652	$26,412
High 3%	$1,113,829	$834,058	$5,988,281	$74,692
Mid 3%	$802,390	$557,390	$3,904,144	$50,552
Low 3%	$490,951	$275,817	$2,413,913	$26,412
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$12,904,757	$9,335,534	$68,043,038	$846,676
Mid 7%	$9,374,411	$6,509,686	$44,418,113	$573,037
Low 7%	$5,844,065	$3,159,011	$33,798,795	$299,399
High 3%	$17,068,091	$12,780,930	$91,763,207	$1,144,562
Mid 3%	$12,295,662	$8,541,335	$59,826,322	$774,649
Low 3%	$7,523,234	$4,226,562	$36,990,321	$404,736

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	15	15	7	7	2	2
$200,000 - $500,000	17	17	10	10	8	8
$500,000 - $1,000,000	3	3	17	16	17	18
$1,000,000 - $2,500,000	6	4	4	4	10	9
> $2,500,000	0	2	3	4	4	4

5.4.12 Upper Willamette O. mykiss ESU

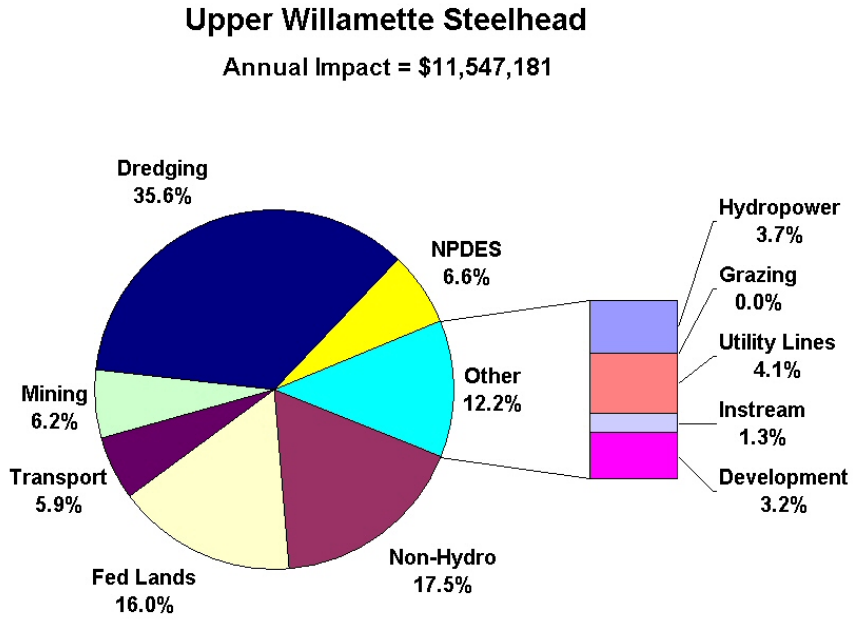
5.4.12.1 Watershed Characteristics

For this ESU, the analysis covers 36 watersheds, averaging 142.5 square miles in size and ranging from 53.3 to 315.2 square miles. The estimated total population for all watersheds in this ESU is 1,857,563 and the estimated total personal income is $56,623,752,000.

5.4.12.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$18,115,971	$205,355,320
Mid 7%	$11,547,181	$130,894,169
Low 7%	$4,978,390	$56,433,019
High 3%	$17,963,213	$275,264,662
Mid 3%	$11,394,422	$174,605,835
Low 3%	$4,825,632	$73,947,009

5.4.12.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.12.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $320,755.
- The highest annual total impact at the watershed level is $3,372,525 for Columbia Slough/Willamette River, while the lowest is $4,019 for South Santiam River / Foster Reservoir.
- The activity with the highest impact is Dredging which averages $114,170 across all watersheds in this ESU and ranges from $0 to $2,466,079.
- The activity with the lowest impact is Grazing which averages $20 across all watersheds in this ESU and ranges from $0 to $124.
- 1 watershed has annual total impacts of more than $1 million, while 1 has annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$503,221	$254,107	$5,339,487	$6,648
Mid 7%	$320,755	$161,358	$3,372,525	$4,019
Low 7%	$138,289	$61,148	$1,405,563	$1,389
High 3%	$498,978	$246,947	$5,325,168	$6,648
Mid 3%	$316,512	$161,358	$3,358,206	$4,019
Low 3%	$134,045	$61,148	$1,391,244	$1,389

	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$5,704,314	$2,880,452	$60,526,268	$75,363
Mid 7%	$3,635,949	$1,829,091	$38,229,579	$45,555
Low 7%	$1,567,584	$693,145	$15,932,890	$15,747
High 3%	$7,646,241	$3,784,171	$81,601,811	$101,878
Mid 3%	$4,850,162	$2,472,620	$51,460,476	$61,582
Low 3%	$2,054,084	$937,015	$21,319,140	$21,287

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	29	29	20	20	14	14
$200,000 - $500,000	6	6	10	10	12	12
$500,000 - $1,000,000	0	0	5	5	7	7
$1,000,000 - $2,500,000	1	1	0	0	2	2
> $2,500,000	0	0	1	1	1	1

5.4.13 Middle Columbia River O. mykiss ESU

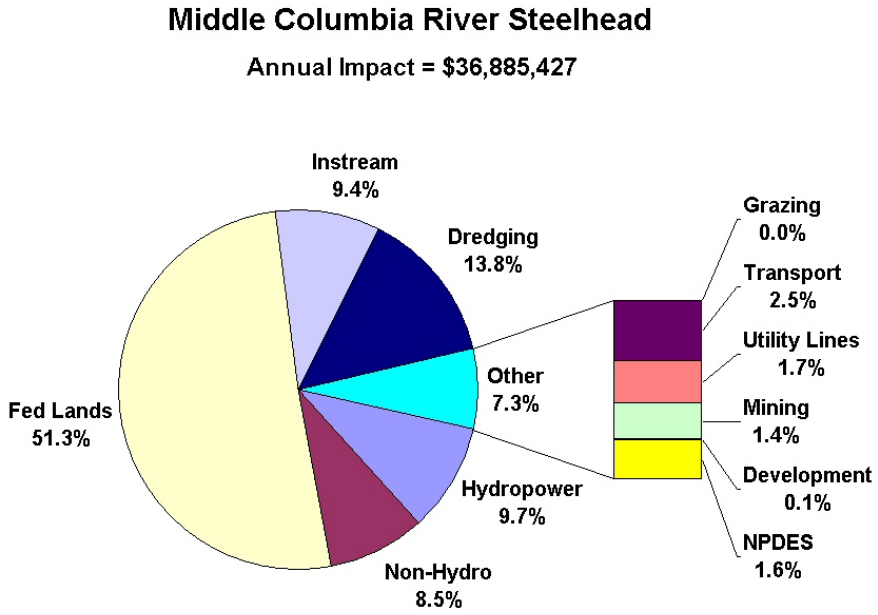
5.4.13.1 Watershed Characteristics

For this ESU, the analysis covers 113 watersheds, averaging 220.1 square miles in size and ranging from 58.4 to 849.8 square miles. The estimated total population for all watersheds in this ESU is 617,838 and the estimated total personal income is $14,192,698,000.

5.4.13.2 Economic Impacts of Critical Habitat Designation for the Entire ESU

Case	Annual Total Impact	Present Value over 20 years
High 7%	$52,909,369	$599,759,193
Mid 7%	$35,021,657	$396,991,327
Low 7%	$17,133,945	$194,223,462
High 3%	$52,420,944	$803,288,010
Mid 3%	$34,533,231	$529,180,302
Low 3%	$16,645,519	$255,072,593

5.4.13.3 Economic Impacts of Individual Activities for the Entire ESU



5.4.13.4 Economic Impacts at the Watershed Level

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $315,510.
- The highest annual total impact at the watershed level is $2,266,329 for Naches River/Tieton River, while the lowest is $133 for Lower Touchet River.
- The activity with the highest impact is Federal Lands which averages $169,060 across all watersheds in this ESU and ranges from $0 to $1,218,321.
- The activity with the lowest impact is Grazing which averages $7 across all watersheds in this ESU and ranges from $0 to $66.
- 7 watersheds have annual total impacts of more than $1 million, while 23 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$476,661	$290,882	$3,644,758	$201
Mid 7%	$315,510	$188,849	$2,266,329	$133
Low 7%	$154,360	$89,997	$1,542,991	$25
High 3%	$472,261	$290,882	$3,644,758	$201
Mid 3%	$311,110	$188,849	$2,155,444	$133
Low 3%	$149,960	$89,997	$1,208,767	$25
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$5,403,236	$3,297,323	$41,315,506	$2,282
Mid 7%	$3,576,498	$2,140,721	$25,690,193	$1,512
Low 7%	$1,749,761	$1,020,174	$17,490,722	$284
High 3%	$7,236,829	$4,457,421	$55,851,546	$3,085
Mid 3%	$4,767,390	$2,893,892	$33,029,598	$2,044
Low 3%	$2,297,951	$1,379,102	$18,522,901	$383

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	89	89	56	56	38	38
$200,000 - $500,000	16	16	38	38	38	38
$500,000 - $1,000,000	4	4	10	10	23	23
$1,000,000 - $2,500,000	2	2	7	7	10	10
> $2,500,000	0	0	0	0	2	2

5.5 Aggregate Impacts for all ESUs

This section presents results for all 13 ESUs combined. We aggregated all watersheds, regardless of the ESU to gauge the impacts for the entire extent of the 13 critical habitat designations. This is not the same as summing the ESU-level impacts because a watershed can be in more than one ESU, and so a simple summation would double-count such a watershed. We have included all watersheds considered in the 4(b)(2) process, whether or not they are proposed for exclusion.

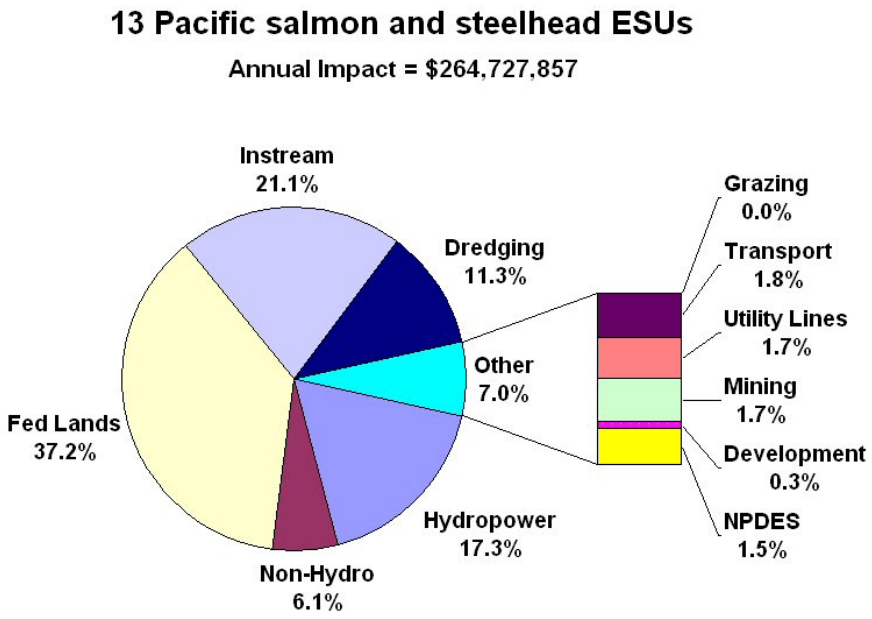
5.5.1 Watershed Characteristics for all ESUs

For all 13 ESUs, the analysis covers 685 watersheds, averaging 145.9 square miles in size and ranging from 2.5 to 849.8 square miles. The estimated total population for all watersheds is 7,540,791 and the estimated total personal income is $238,658,641,000.

5.5.2 Economic Impacts of Critical Habitat Designation for all ESUs

Case	Annual Total Impact	Present Value over 20 years
High 7%	$383,312,627	$4,345,076,796
Mid 7%	$264,727,857	$3,000,847,841
Low 7%	$146,143,087	$1,656,618,885
High 3%	$374,065,180	$5,732,099,676
Mid 3%	$255,480,410	$3,914,930,482
Low 3%	$136,895,640	$2,097,761,289

5.5.3 Economic Impacts of Individual Activities for all ESUs



5.5.4 Economic Impacts at the Watershed Level for all ESUs

At a 7% discount rate and the midpoint per-project cost estimate:

- The average annual total impact at the watershed level is $386.464.
- The highest annual total impact at the watershed level is $15,221,609 for Lake Washington (Puget Sound chinook salmon), while the lowest is $0 for Deadman Creek (Snake River Basin O. mykiss) and Millicoma River (Oregon Coast coho salmon).
- The activity with the highest impact is Federal Lands, which averages $143,900 across all watersheds and ranges from $0 to $1,334,903.
- The activity with the lowest impact is Grazing which averages $10 across all watersheds in this ESU and ranges from $0 to $124.
- 50 watersheds have annual total impacts of more than $1 million, while 125 have annual total impacts less than $50 thousand.

	Total Annual Impact for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$559,580	$248,827	$23,371,294	$0
Mid 7%	$386,464	$160,043	$15,221,609	$0
Low 7%	$213,348	$70,676	$7,071,925	$0
High 3%	$546,081	$244,231	$23,371,294	$0
Mid 3%	$372,964	$158,932	$15,221,609	$0
Low 3%	$199,848	$70,676	$7,071,925	$0
	Present Value of Total Impact over 20 years for Individual Watersheds			
Case	**Average**	**Median**	**Maximum**	**Minimum**
High 7%	$6,343,178	$2,820,599	$264,927,525	$0
Mid 7%	$4,380,800	$1,814,178	$172,546,004	$0
Low 7%	$2,418,422	$801,154	$80,164,484	$0
High 3%	$8,368,029	$3,742,553	$358,137,008	$0
Mid 3%	$5,715,227	$2,435,450	$233,252,886	$0
Low 3%	$3,062,425	$1,083,025	$108,368,764	$0

Frequency of Annual Total Impacts for Individual Watersheds						
Watershed Annual Total Impact	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
< $200,000	532	532	396	396	311	311
$200,000 - $500,000	102	102	153	153	163	164
$500,000 - $1,000,000	28	29	87	86	122	122
$1,000,000 - $2,500,000	16	11	35	34	65	63
> $2,500,000	7	11	14	16	24	25

Section 6
References

Bakkala, R.G. 1970. Synopsis of biological data on the chum salmon, Oncorhynchus keta Walbaum 1792. FAO species synop. No. 41, U.S. Fish. Wild. Serv. circ. 315. 89 p.

Bax, N.J. 1983. The early migration of juvenile chum salmon (Oncorhynchus keta) through Hood Canal - its variability and consequences. Ph.D. Dissertation, Univ. of Wash, Seattle, WA. 196 p.

Beamish, R.J., M. Folkes, R. Sweeting and C. Mahnken. 1998. Intra-annual changes in the abundance of coho, chinook, and chum salmon in Puget Sound in 1997. In Puget Sound Research Proceedings 1998, Puget Sound Water Quality Action Team, Olympia. http://www.psat.wa.gov/Publications/98_proceedings/pdfs/4c_beamish.pdf

Beechie, T.J., E.A. Steel, P. Roni, and E. Quimby, 2003. Ecosystem Recovery Planning for Listed Salmon: An Integrated Assessment Approach for Salmon Habitat, NOAA Fisheries, Northwest Fisheries Science Center.

Bonneville Power Administration (BPA), 1992. "Implement Willamette Basin Mitigation Project." BPA Project Number 199206800. Available at http://173.160.2.246/ Environment/EW/PROPOSALS/AIWP/2001/CD/projects/199206800.htm.

BPA, 2004. FY2005 Congressional Budget, Funding Profile by Subprogram, available at http://www.bpa.gov/corporate/dff/conbud/pdf/02a%20Fund%20Profile%20Rev%201-30-04.pdf

Brookshire, D.S., M. McKee, and G. Watts, 1993. Draft Economic Analysis of Proposed Critical Habitat Designation in the Colorado River Basin for the Razorback Sucker, Humpback Chub, Colorado Squawfish, and Bonytail, U.S. Fish and Wildlife Service, Washington, D.C.

Brookshire, D.S., M. McKee, and C. Schmidt, 1995. Economic Analysis of Critical Habitat Designation in the Virgin River Basin for the Woundfin and Virgin River Chub, U.S. Fish and Wildlife Service, Washington, D.C.

California Department of Conservation, 2001. "California Again Leads the Nation in Production of Non-Fuel Minerals," press release, August 7, 2001, Sacramento, California..

California Department of Water Resources, 1993. Division of Safety of Dams. Dams within the Jurisdiction of the State of California, Bulletin 17

Columbia Basin Bulletin, 2004. "Ninth Circuit Upholds Salmon Pesticide Ban During Appeal," June 25, 2004.

Columbia Basin Bulletin, 2003. "Grant PUD Meets Survival Goals at Two Mid-Columbia Dams," September 26, 2003.

Elliott D. Pollack and Company, 1999. The Economic and Fiscal Impact of the Designation of 60,060 Acres of Privately Owned Land in Pima County, Arizona as Critical Habitat for the Cactus Ferruginous Pygmy-Owl, prepared for Southern Arizona Homebuilders Association.

Environmental Protection Agency (EPA), 2000. Guidelines for Preparing Economic Analyses, EPA-240-R-00-003, Washington, D.C..

EPA, 2003. EPA Region 10 Guidance For Pacific Northwest State and Tribal Temperature Water Quality Standards, EPA 910-B-03-002, Washington, D.C.

Federal Energy Regulatory Commission (FERC), 2001. Hydroelectric Project Licensing Handbook.

FERC, 2003. Wetland and Waterbody Construction and Mitigation Procedures, Washington, D.C.

Fraser, F.J., D.D. Bailey, and M.J. Wood. 1978. Big Qualicum River Salmon Development Project, Vol. 3. Experimental rearing of chum salmon juveniles (Oncorhynchus keta) in freshwater (1968-1970). Can. Fish. Mar. Serv. Tech. Rep. 752.

Fish and Wildlife Service (FWS), 2002. Lower Snake River Compensation Plan Office, Annual Report, Fiscal Year 2001, October 1, 2000 - September 30, available at http://lsnakecomplan.fws.gov/Reports/LSRCP/anreport.pdf.

FWS, 2004. Final Economic Analysis of Critical Habitat Designation for the Bull Trout, available at http://pacific.fws.gov/bulltrout/final_colkla/pdf/BTFinalEA.pdf

Gold, M.L. J.E. Siegel, L.B. Russell, and M.C. Weinstein, 1996. Cost Effectiveness in Health and Medicine: The Report of the Panel on Cost-Effectiveness in Health and Medicine, Oxford University Press, New York.

Grant County P.U.D., 2004. Figures for Salmon Update 2004, Ephrata, Washington.

Groot, C. and L. Margolis (editors). 1991. Pacific salmon life histories. Univ. B.C. Press, Vancouver, B.C., 564 p.

Hamilton, J. and N. Whittlesey, 1996. Cost of Using Water from the Snake River Basin to Augment Flows for Endangered Species. Presentation to the Snake River Salmon Economics Technical Committee.

Healey, M.C., 1982. Juvenile Pacific salmon in estuaries: the life support system. Pp. 315-341 in V.S. Kennedy (ed.) Estuarine Comparisons. Academic Press, New York, NY. 709 p.

Huppert, D., D.L. Fluharty, E. Doyle, and A. Benyounes, 1996. Economics of Snake River Salmon Recovery: A Report to the National Marine Fisheries Service.

Huppert, D., G. Green, W. Byers, A. Subkoviak, and A. Wenzl., 2004. Economics of Columbia River Initiative, Final Report to the Washington Department of Ecology and CRI Economics Advisory Committee.

Johnson, O.W., W.S. Grant, R.G. Kope, K. Neely, F.W. Waknitz, and R.S. Waples. 1997. Status review of chum salmon from Washington, Oregon, and California. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-NWFSC-32, 280 p.

Kohler, S., 2002. "California Non-Fuel Minerals 2002." California Department of Conservation, California Geological Survey, Sacramento, California.

Layton, D., G. Brown, and M. Plummer, 1999. "Valuing Multiple Programs to Improve Fish Populations," Report to the Washington State Department of Ecology.

Loomis, J.B., 1996. "Measuring the Economic Benefits of Removing Dams and Restoring the Elwha River: Results of a Contingent Valuation Survey," Water Resources Research 32(2): 441-447.

Marriott, D., and 27 contributors. 2002. Lower Columbia River and Columbia River Estuary Subbasin Summary. Report Prepared for the Northwest Power Planning Council, dated May 17, 2002. (Available at: http://www.cbfwa.org/)

Martin, D.J., D.R. Glass, C.J. Whitmus, C A. Simenstad, D.A. Milward, E.C. Volk, M.L. Stevenson, P. Nunes, M. Savvoie, and R.A. Grotefendt. 1986. Distribution, seasonal abundance, and feeding dependencies of juvenile salmon and non-salmonid fishes in the Yukon River Delta. NOAA, OCSEAP Final Rep. 55(1988):381-770. Avail. Arctic Environment Assessment Center, 222 W. 8th Ave., No. 55, Anchorage, AK 99513.

Mazer, J.I., and M.P. Shepard. 1962. Marine survival, distribution and migration of pink salmon off the British Columbia coast. H.R. MacMillan Lectures in Fisheries, Univ. Brit. Col., Vancouver, B.C., Canada, p. 113-121.

McElhany, P., M.H. Ruckelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-42, 156p. Available at http://www.nwfsc.noaa.gov/publications/techmemos/tm42/tm42.pdf

Meyer, S.M., 1998. "The Economic Impact of the Endangered Species Act on the Housing and Real Estate Markets." New York University Environmental Law Journal. 6(450):1-13.

Mobrand Biometrics, Inc., 1999. The EDT Method.

National Marine Fisheries Service (NMFS), 1995. Biological Opinion, Reinitiation of Consultation on 1994-1998 Operation of the Federal Columbia River Power System and Juvenile Transportation Program in 1995 and Future Years.

NMFS, 1998. Supplemental Biological Opinion, Operation of the Federal Columbia River Power System Including the Smolt Monitoring Program and the Juvenile Fish Transportation Program: A Supplement to the Biological Opinion Signed on March 2, 1995, For the Same Projects.

NMFS, 2000. Biological Opinion, Reinitiation of Consultation on Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin.

NMFS, 2001. Biological Opinion of Corps of Engineers' Programmatic Consultation for Permit Issuance for 15 Categories of Activities in Oregon, March 21, 2001. OSB2001-0016

NMFS, 2002. NMFS National Gravel Extraction Policy (draft). Available at http://www.nmfs.noaa.gov/habitat/habitatprotection/pdf/gravelguidance.pdf

NMFS, 2003a. Biological Opinion for Construction of a new boat dock at Columbia Cove Park, Okanogan County, Washington, May 16, 2003. 2001/01013

NMFS, 2003b. Biological Opinion for McCormick Pier Repair Project, Willamette River Mile 11.3, Multnomah County, Oregon, May 23, 2003. 2002/01399

NMFS, 2003c. Biological Opinion for Rouge River (Depot Street) Bridge Replacement Project, Jackson County, Oregon, October 23, 2003. 2002/00816

NMFS, 2003d. Biological Opinion for the Georgia-Pacific Bulkhead Replacement Project, Yaquina River Basin, Lincoln County, Oregon, February 21, 2003. 2002/01314

NMFS, 2003e. Biological Opinion for the Myrtle Creek and Tri-City Sanitary District Wastewater Treatment Plant Improvement, South Umpqua River, Douglas County, Oregon, April 30, 2003, 2002/00376.

NMFS, 2003f. Biological Opinion for the Port Of St. Helens Industrial Outfall and Portland General Electric Power Plant, Port Westward Industrial Park, Columbia River, Columbia County, Oregon, August 1, 2003. 2002/00013

NMFS, 2003g. Biological Opinion of Corps for Miller Creek Wastewater Treatment Plant Outfall Replacement, WRIA 9, August 15, 2003, 2002/00355

NMFS, 2003h. Draft Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Consultation, White River Hydroelectric Project FERC Project Number 2494-002.

NMFS, 2003i. Endangered Species Act Formal Section 7 and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Joe Bernert Towing Company Instream Gravel Mining Project, Lower Williamette River Basin, River Miles 27-56.6, Clackamas, Marion, and Yamhill Counties, Oregon (Corps No. 199601626).

NMFS, 2003j. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for U.S. Forest Service and Bureau of Land Management Programmatic Activities in Northwestern Oregon, NOAA Fisheries, 2002/01254 (FS) and 2002/01880 (BLM).

NMFS, 2003k. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for U.S. Forest Service Programmatic Culvert Replacement Activities in Washington and Eastern Oregon, NOAA Fisheries, 2003/00676.

NMFS, 2004a. Initial Assessment of NOAA Fisheries' Critical Habitat Analytical Review Teams For 13 Evolutionarily Significant Units of Pacific Salmon and O. mykiss. NOAA Fisheries Northwest Region Report. October 2004. (Available from NOAA Fisheries at http://www.nwr.noaa.gov/1salmon/salmesa/crithab/CHsite.htm)

NMFS, 2004b. Memorandum from M. Longenbaugh (NOAA Fisheries) Through S. Landino (NOAA Fisheries) to D. Darm (NOAA Fisheries) re: review of integrated natural resource management plans in WA. September 29, 2004.

NMFS, 2004b. Memorandum from M. Longenbaugh (NOAA Fisheries) Through S. Landino (NOAA Fisheries) to D. Darm (NOAA Fisheries) re: review of integrated natural resource management plans in WA. September 29, 2004.

NMFS, 2004d. Designation of Critical Habitat for West Coast Salmon and Steelhead: Draft 4(b)(2) Report. NOAA Fisheries Northwest Region Report. October 2004. (Available from NOAA Fisheries at http://www.nwr.noaa.gov/1salmon/salmesa/crithab/CHsite.htm)

NMFS, 2004e. Memorandum from G. Sims (NOAA Fisheries) to D. Darm (NOAA Fisheries) re: critical habitat and Indian lands. September 28, 2004.

NMFS, 2004f. Draft Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Consultation, License Amendment for Operation of the Baker River Hydroelectric Project (FERC No. 2150) through April 2006, Baker River, HUC 17110007, Skagit and Whatcom Counties, Washington.

NMFS, 2004g. Northwest Salmon Recovery: Integrating Habitat, Hydropower, Harvest and Hatchery Programs with State/Federal/Local Recovery Efforts, Report to Congress.

NMFS, 2004h. State/Tribal Review Draft, Biological Opinion, Operation of the Federal Columbia River Power System including the 19 Bureau of Reclamation Projects in the Columbia Basin (Revised and reissued pursuant to court order, NWF v. NMFS, Civ. No. CV 01-640-RE (D. Oregon)).

Northwest Power Planning Council (NPPC), 1997. Alternative Scenarios for Future Hydroelectric Operations: Preliminary Report.

NPPC, 2000. Analysis of Recommendations to Amend the Fish and Wildlife Program Relating to Mainstem Hydroelectric Operations, memorandum from John Fazio.

Northwest Power and Conservation Council (NPCC), 2004. Third Annual Report to the Northwest Governors on Expenditures of the Bonneville Power Administration to Implement the Columbia River Basin Fish and Wildlife Program of the Northwest Power and Conservation Council, 1978 - 2002, Council Document 2004-3.

Olsen, D., J. Richards, and R. D. Scott, 1991. "Existence and Sport Values for Doubling the Size of Columbia River Basin Salmon and Steelhead Runs," Rivers 2(1): 44-56.

Office of Management and Budget (OMB), 2001. Memorandum for Heads of Executive Departments and Agencies, and Independent Regulatory Agencies, M-01-27, Washington, D.C.

OMB, 2003. Circular A-4, Regulatory Analysis, Washington, D.C..

Pacific Coast Salmon Fishery Management Plan. 2000. Amendment 14 to the Pacific Coast Salmon Plan (1997). (Available at http://www.pcouncil.org/salmon/salfmp/a14.html)

Peterman, R.M. 1978. Testing for density-dependent marine survival in Pacific salmonids. J. Fish. Res. Board Can. 35:1434-1450.

Peters, L., 2003. . "ESA Costs for the Hydropower Sector," memorandum to Industrial Economics, Inc.

Puget Sound Energy, 2004. Baker River Hydroelectric Project, FERC No. 2150, Application for New License, Major Project—Existing Dam, Volume I, Part 1 of 2, Exhibits A, B, C, D and H, 18 CFR, Part 4, Subpart F, Section 4.51.

Risk Management Association, 2002. RMA Annual Statement Studies, Philadelphia, Pennsylvania.

Sakuramoto, K., and S. Yamada. 1980. A study on the planting effect of salmon. 1. A mathematical model for the derivation of their rate of return and its applications. Bull. Jpn. Soc. Sci. Fish. 46(6):653-661.

Salo, E.O. 1991. Life history of chum salmon, Oncorhynchus keta. In C. Groot and L. Margolis (editors), Pacific salmon life histories, p. 231-309. Univ. B.C. Press, Vancouver, B.C.

Schamberger, M.L., J.J. Charbonneau, M.J. Hay, and R.L. Johnson, 1992. Economic Analysis of Critical Habitat Designation Effects for the Northern Spotted Owl, U.S. Fish and Wildlife Service, Washington, D.C.

Science Applications International Cooperation, 2003. Economic Analysis of the Proposed Water Quality Standards Rule for the State of Oregon, EPA No. 68-C-99-252, Reston, VA.

Simenstad, C.A., K.L. Fresh, and E.O. Salo. 1982. The role of Puget Sound and Washington coastal estuaries in the life history of Pacific salmon: an unappreciated function. In: V. Kennedy, editor. Estuarine comparisons. Academic Press, New York (343-364).

Spence, B.C., G.A. Lomnicky, R.M. Hughes, and R.P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon. (Available at http://www.nwr.noaa.gov/1habcon/habweb/habguide/ManTech/front.htm)

U.S. Bureau of Reclamation (USBR), 1999. Snake River Flow Augmentation Impact Analysis Appendix, Prepared for the U.S. Army Corps of Engineers, Walla Walla District's Lower Snake River Juvenile Salmon Migration Feasibility Study and Environmental Impact Statement, United States Department of the Interior, Bureau of Reclamation, Pacific Northwest Region, Boise, Idaho.

U.S. Bureau of Reclamation (USBR), U.S. Army Corps of Engineers (USACE), and Bonneville Power Administration (BPA), 2003. Endangered Species Act 2003 Check-In Report for the Federal Columbia River Power System.

U.S. Department of Agriculture (USDA), 2003. "Economic Impact of Spray Buffers on Agriculture in the Pacific Northwest," Office of the Chief Economist, Washington, D.C.

U.S. Forest Service (USFS) and U.S. Bureau of Land Management (BLM), 2004. Record of Decision, Amending Resource Management Plans for Seven Bureau of Land Management Districts and Land and Resource Management Plans for Nineteen National Forests Within the Range of the Northern Spotted Owl Decision to Clarify Provisions Relating to the Aquatic Conservation Strategy.

Washington Department of Ecology (WDOE), 2001. Year 2001 Minimum Requirements for Stormwater Management in Western Washington Cost Analysis, Olympia, Washington.

Washington Department of Fish and Wildlife (WDFW), 2003. Stream Habitat Restoration Guidelines. Washington Department of Transportation. Washington Department of Ecology, Olympia, Washington.

Washington Department of Fish and Wildlife (WDFW) and Point No Point Treaty Tribes (PNPTT), 2000. Summer Chum Salmon Conservation Initiative – An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region. Washington Department of Fish and Wildlife. Olympia, WA. 800 p. Available at: http://wdfw.wa.gov/fish/chum/chum.htm

Williams, G.D., R.M. Thom, M.C. Miller, D.L. Woodruff, N.R. Evans, and P.N. Best. 2003. Bainbridge Island Nearshore Assessment: Summary of Best Available Science. PNWD-3233. Prepared for the City of Bainbridge Island, Bainbridge Island, WA, by Battelle Marine Sciences Laboratory, Sequim, WA.

Zerbe, R., and D. Dively, 1994. Benefit Cost Analysis in Theory and Practice, New York: HarperCollins.

Appendix A
List of Watersheds by ESU

Puget Sound chinook salmon ESU*

Watershed	Watershed Name	Subbasin
1711000201	Bellingham Bay	Strait of Georgia
1711000202	Samish River	Strait of Georgia
1711000204	Birch Bay	Strait of Georgia
1711000401	Upper North Fork Nooksack River	Nooksack
1711000402	Middle Fork Nooksack River	Nooksack
1711000403	South Fork Nooksack River	Nooksack
1711000404	Lower North Fork Nooksack River	Nooksack
1711000405	Nooksack River	Nooksack
1711000504	Skagit River/Gorge Lake	Upper Skagit
1711000505	Skagit River/Diobsud Creek	Upper Skagit
1711000506	Cascade River	Upper Skagit
1711000507	Skagit River/Illabot Creek	Upper Skagit
1711000508	Baker River	Upper Skagit
1711000601	Upper Sauk River	Sauk
1711000602	Upper Suiattle River	Sauk
1711000603	Lower Suiattle River	Sauk
1711000604	Lower Sauk River	Sauk
1711000701	Middle Skagit River/Finney Creek	Lower Skagit
1711000702	Lower Skagit River/Nookachamps Creek	Lower Skagit
1711000801	North Fork Stillaguamish River	Stillaguamish
1711000802	South Fork Stillaguamish River	Stillaguamish
1711000803	Lower Stillaguamish River	Stillaguamish
1711000901	Tye and Beckler Rivers	Skykomish
1711000902	Skykomish River Forks	Skykomish
1711000903	Skykomish River/Wallace River	Skykomish
1711000904	Sultan River	Skykomish
1711000905	Skykomish River/Woods Creek	Skykomish
1711001003	Middle Fork Snoqualmie River	Snoqualmie
1711001004	Lower Snoqualmie River	Snoqualmie
1711001101	Pilchuck River	Snohomish
1711001102	Snohomish River	Snohomish
1711001201	Cedar River	Lake Washington
1711001202	Lake Sammamish	Lake Washington
1711001203	Lake Washington	Lake Washington
1711001204	Sammamish River	Lake Washington
1711001301	Upper Green River	Duwamish
1711001302	Middle Green River	Duwamish
1711001303	Lower Green River	Duwamish

Puget Sound chinook salmon ESU*

Watershed	Watershed Name	Subbasin
1711001401	Upper White River	Puyallup
1711001402	Lower White River	Puyallup
1711001403	Carbon River	Puyallup
1711001404	Upper Puyallup River	Puyallup
1711001405	Lower Puyallup River	Puyallup
1711001502	Mashel/Ohop	Nisqually
1711001503	Lowland	Nisqually
1711001601	Prairie	Deschutes
1711001602	Prairie	Deschutes
1711001701	North/South Fork Skokomish	Skokomish
1711001802	Lower West Hood Canal Frontal	Hood Canal
1711001803	Hamma Hamma River	Hood Canal
1711001804	Duckabush River	Hood Canal
1711001805	Dosewallips River	Hood Canal
1711001806	Big Quilcene River	Hood Canal
1711001808	West Kitsap	Hood Canal
1711001900	Kennedy/Goldsborough	Kitsap
1711001901	Puget	Kitsap
1711001902	Prairie	Kitsap
1711001904	Puget Sound/East Passage	Kitsap
1711002003	Dungeness River	Dungeness/Elwha
1711002004	Port Angeles Harbor	Dungeness/Elwha
1711002007	Elwha River	Dungeness/Elwha
N01	Nooksack	WRIA1
N02	San Juan	WRIA2
N03	Lower Skagit / Samish	WRIA3
N04	Stillaguamish	WRIA5
N05	Island	WRIA6
N06	Snohomish	WRIA7
N07	Cedar-Sammamish	WRIA8
N08	Duwamish-Green	WRIA9
N09	Puyallup-White	WRIA10
N10	Nisqually	WRIA11
N11	Chambers-Clover	WRIA12
N12	Deschutes	WRIA13
N13	Kennedy-Goldsborough	WRIA14
N14	Kitsap	WRIA15
N15	Kitsap	WRIA15
N16	Kennedy-Goldsborough	WRIA14
N17	Skokomish-Dosewallips	WRIA16
N18	Quilcene-Snow	WRIA17

Puget Sound chinook salmon ESU*

Watershed	Watershed Name	Subbasin
N19	Elwah-Dungeness	WRIA18

* Watersheds beginning with "N" are nearshore marine areas (see the discussion of these areas on p. 2-6). The watershed and subbasin names are taken from the Water Resource Inventory Area names and numbers.

Lower Columbia River chinook salmon ESU

Watershed	Watershed Name	Subbasin
1707010506	East Fork Hood River	Middle Columbia/Hood
1707010507	West Fork Hood River	Middle Columbia/Hood
1707010508	Hood River	Middle Columbia/Hood
1707010509	White Salmon River	Middle Columbia/Hood
1707010510	Little White Salmon River	Middle Columbia/Hood
1707010511	Wind River	Middle Columbia/Hood
1707010512	Middle Columbia/Grays Creek	Middle Columbia/Hood
1707010513	Middle Columbia/Eagle Creek	Middle Columbia/Hood
1708000101	Salmon River	Lower Columbia/Sandy
1708000102	Zigzag River	Lower Columbia/Sandy
1708000103	Upper Sandy River	Lower Columbia/Sandy
1708000104	Middle Sandy River	Lower Columbia/Sandy
1708000105	Bull Run River	Lower Columbia/Sandy
1708000106	Washougal River	Lower Columbia/Sandy
1708000107	Columbia Gorge Tributaries	Lower Columbia/Sandy
1708000108	Lower Sandy River	Lower Columbia/Sandy
1708000109	Salmon Creek	Lower Columbia/Sandy
1708000205	East Fork Lewis River	Lewis
1708000206	Lower Lewis River	Lewis
1708000301	Kalama River	Lower Columbia/Clatskanie
1708000302	Beaver Creek/Columbia River	Lower Columbia/Clatskanie
1708000303	Clatskanie River	Lower Columbia/Clatskanie
1708000304	Germany/Abernathy	Lower Columbia/Clatskanie
1708000305	Skamokawa/Elochoman	Lower Columbia/Clatskanie
1708000306	Plympton Creek	Lower Columbia/Clatskanie
1708000401	Headwaters Cowlitz River	Upper Cowlitz
1708000402	Upper Cowlitz River	Upper Cowlitz
1708000403	Cowlitz Valley Frontal	Upper Cowlitz
1708000404	Upper Cispus River	Upper Cowlitz
1708000405	Lower Cispus River	Upper Cowlitz
1708000501	Tilton River	Cowlitz
1708000502	Riffe Reservoir	Cowlitz

Lower Columbia River chinook salmon ESU

Watershed	Watershed Name	Subbasin
1708000503	Jackson Prairie	Cowlitz
1708000504	North Fork Toutle River	Cowlitz
1708000505	Green River	Cowlitz
1708000506	South Fork Toutle River	Cowlitz
1708000507	East Willapa	Cowlitz
1708000508	Coweeman	Cowlitz
1708000601	Youngs River	Lower Columbia
1708000602	Big Creek	Lower Columbia
1708000603	Grays Bay	Grays/Elokoman
1709000704	Abernethy Creek	Middle Willamette
1709001105	Eagle Creek	Clackamas
1709001106	Lower Clackamas River	Clackamas
1709001201	Johnson Creek	Lower Willamette
1709001202	Scappoose Creek	Lower Willamette
1709001203	Columbia Slough/Willamette River	Lower Willamette

Upper Willamette River chinook salmon ESU

Watershed	Watershed Name	Subbasin
1709000101	Upper Middle Fork Willamette River	Middle Fork Willamette
1709000102	Hills Creek	Middle Fork Willamette
1709000103	Salt Creek/Willamette River	Middle Fork Willamette
1709000104	Salmon Creek	Middle Fork Willamette
1709000105	Hills Creek Reservoir	Middle Fork Willamette
1709000106	North Fork of Middle Fork Willamette River	Middle Fork Willamette
1709000107	Middle Fork Willamette/Lookout Point	Middle Fork Willamette
1709000108	Little Fall Creek	Middle Fork Willamette
1709000109	Fall Creek	Middle Fork Willamette
1709000110	Lower Middle Fork of Willamette River	Middle Fork Willamette
1709000201	Row River	Coast Fork Willamette
1709000202	Mosby Creek	Coast Fork Willamette
1709000203	Upper Coast Fork Willamette River	Coast Fork Willamette
1709000205	Lower Coast Fork Willamette River	Coast Fork Willamette
1709000301	Long Tom River	Upper Willamette
1709000302	Muddy Creek	Upper Willamette
1709000303	Calapooia River	Upper Willamette
1709000304	Oak Creek	Upper Willamette
1709000305	Marys River	Upper Willamette
1709000306	Luckiamute River	Upper Willamette
1709000401	Upper Mckenzie River	Mckenzie

Upper Willamette River chinook salmon ESU

Watershed	Watershed Name	Subbasin
1709000402	Horse Creek	Mckenzie
1709000403	South Fork Mckenzie River	Mckenzie
1709000404	Blue River	Mckenzie
1709000405	Mckenzie River/Quartz Creek	Mckenzie
1709000406	Mohawk River	Mckenzie
1709000407	Lower Mckenzie River	Mckenzie
1709000504	Middle North Santiam River	North Santiam
1709000505	Little North Santiam River	North Santiam
1709000506	Lower North Santiam River	North Santiam
1709000601	Hamilton Creek/South Santiam River	South Santiam
1709000602	Crabtree Creek	South Santiam
1709000603	Thomas Creek	South Santiam
1709000606	South Santiam River	South Santiam
1709000607	South Santiam River / Foster Reservoir	South Santiam
1709000608	Wiley Creek	South Santiam
1709000701	Mill Creek/Willamette River	Middle Willamette
1709000702	Rickreall Creek	Middle Willamette
1709000703	Willamette River/Chehalem Creek	Middle Willamette
1709000704	Abernethy Creek	Middle Willamette
1709000804	Lower South Yamhill River	Yamhill
1709000805	Salt Creek/South Yamhill River	Yamhill
1709000806	North Yamhill River	Yamhill
1709000807	Yamhill River	Yamhill
1709000901	Abiqua Creek/Pudding River	Molalla/Pudding
1709000902	Butte Creek/Pudding River	Molalla/Pudding
1709000903	Rock Creek/Pudding River	Molalla/Pudding
1709000904	Senecal Creek/Mill Creek	Molalla/Pudding
1709000905	Upper Molalla River	Molalla/Pudding
1709000906	Lower Molalla River	Molalla/Pudding
1709001101	Collawash River	Clackamas
1709001102	Upper Clackamas River	Clackamas
1709001103	Oak Grove Fork Clackamas River	Clackamas
1709001104	Middle Clackamas River	Clackamas
1709001105	Eagle Creek	Clackamas
1709001106	Lower Clackamas River	Clackamas
1709001201	Johnson Creek	Lower Willamette
1709001203	Columbia Slough/Willamette River	Lower Willamette

Upper Columbia River spring-run chinook salmon ESU

Watershed	Watershed Name	Subbasin
1702000505	Upper Columbia/Swamp Creek	Chief Joseph
1702000801	Lost River	Methow
1702000802	Upper Methow River	Methow
1702000803	Upper Chewuch River	Methow
1702000804	Lower Chewuch River	Methow
1702000805	Twisp River	Methow
1702000806	Middle Methow River	Methow
1702000807	Lower Methow River	Methow
1702001001	Entiat River	Upper Columbia/Entiat
1702001002	Lake Entiat	Upper Columbia/Entiat
1702001003	Columbia River/Lynch Coulee	Upper Columbia/Entiat
1702001004	Columbia River/Sand Hollow	Upper Columbia/Entiat
1702001101	White River	Wenatchee
1702001102	Chiawa River	Wenatchee
1702001103	Nason/Tumwater	Wenatchee
1702001104	Icicle/Chumstick	Wenatchee
1702001105	Lower Wenatchee River	Wenatchee
1702001604	Yakima River/Hanson Creek	Upper Columbia/Priest Rapids
1702001605	Middle Columbia/Priest Rapids	Upper Columbia/Priest Rapids
1702001606	Columbia River/Zintel Canyon	Upper Columbia/Priest Rapids
1707010101	Upper Lake Wallula	Middle Columbia/Lake Wallula
1707010102	Lower Lake Wallula	Middle Columbia/Lake Wallula
1707010106	Upper Lake Umatilla	Middle Columbia/Lake Wallula
1707010109	Middle Lake Umatilla	Middle Columbia/Lake Wallula
1707010114	Lower Lake Umatilla	Middle Columbia/Lake Wallula
1707010501	Upper Middle Columbia/Hood	Middle Columbia/Hood
1707010504	Middle Columbia/Mill Creek	Middle Columbia/Hood
1707010512	Middle Columbia/Grays Creek	Middle Columbia/Hood
1707010513	Middle Columbia/Eagle Creek	Middle Columbia/Hood
1708000107	Columbia Gorge Tributaries	Lower Columbia/Sandy

Oregon Coast coho salmon ESU

Watershed	Watershed Name	Subbasin\
1710020101	Necanicum River	Necanicum
1710020201	Upper Nehalem River	Nehalem
1710020202	Middle Nehalem River	Nehalem
1710020203	Lower Nehalem River	Nehalem
1710020204	Salmonberry River	Nehalem
1710020205	North Fork of Nehalem River	Nehalem
1710020206	Lower Nehalem River/Cook Creek	Nehalem

Oregon Coast coho salmon ESU

Watershed	Watershed Name	Subbasin\
1710020301	Little Nestucca River	Wilson/Trask/Nestucca
1710020302	Nestucca River	Wilson/Trask/Nestucca
1710020303	Tillamook River	Wilson/Trask/Nestucca
1710020304	Trask River	Wilson/Trask/Nestucca
1710020305	Wilson River	Wilson/Trask/Nestucca
1710020306	Kilchis River	Wilson/Trask/Nestucca
1710020307	Miami River	Wilson/Trask/Nestucca
1710020308	Tillamook Bay	Wilson/Trask/Nestucca
1710020309	Spring Creek/Sand Lake/Neskowin Creek Frontal	Wilson/Trask/Nestucca
1710020401	Upper Yaquina River	Siletz/Yaquina
1710020402	Big Elk Creek	Siletz/Yaquina
1710020403	Lower Yaquina River	Siletz/Yaquina
1710020405	Middle Siletz River	Siletz/Yaquina
1710020406	Rock Creek/Siletz River	Siletz/Yaquina
1710020407	Lower Siletz River	Siletz/Yaquina
1710020408	Salmon River/Siletz/Yaquina Bay	Siletz/Yaquina
1710020409	Devils Lake/Moolack Frontal	Siletz/Yaquina
1710020501	Upper Alsea River	Alsea
1710020502	Five Rivers/Lobster Creek	Alsea
1710020503	Drift Creek	Alsea
1710020504	Lower Alsea River	Alsea
1710020505	Beaver Creek/Waldport Bay	Alsea
1710020506	Yachats River	Alsea
1710020507	Cummins Creek/Tenmile Creek/Mercer Lake Frontal	Alsea
1710020508	Big Creek / Vingie Creek	Alsea
1710020601	Upper Siuslaw River	Siuslaw
1710020602	Wolf Creek	Siuslaw
1710020603	Wildcat Creek	Siuslaw
1710020604	Lake Creek	Siuslaw
1710020605	Deadwood Creek	Siuslaw
1710020606	Indian Creek/Lake Creek	Siuslaw
1710020607	North Fork Siuslaw River	Siuslaw
1710020608	Lower Siuslaw River	Siuslaw
1710020701	Waohink River/Siltcoos River/Tahkenitch Lake Frontal	Siltcoos
1710030106	Boulder Creek	North Umpqua
1710030107	Middle North Umpqua	North Umpqua
1710030108	Steamboat Creek	North Umpqua
1710030109	Canton Creek	North Umpqua
1710030110	Rock Creek/North Umpqua River	North Umpqua

Oregon Coast coho salmon ESU

Watershed	Watershed Name	Subbasin\
1710030111	Little River	North Umpqua
1710030112	Lower North Umpqua River	North Umpqua
1710030201	Upper South Umpqua River	South Umpqua
1710030202	Jackson Creek	South Umpqua
1710030203	Middle South Umpqua River	South Umpqua
1710030204	Elk Creek/South Umpqua	South Umpqua
1710030205	South Umpqua River	South Umpqua
1710030207	Middle Cow Creek	South Umpqua
1710030208	West Fork Cow Creek	South Umpqua
1710030209	Lower Cow Creek	South Umpqua
1710030210	Middle South Umpqua River	South Umpqua
1710030211	Myrtle Creek	South Umpqua
1710030212	Ollala Creek/Lookingglass	South Umpqua
1710030213	Lower South Umpqua River	South Umpqua
1710030301	Upper Umpqua River	Umpqua
1710030302	Calapooya Creek	Umpqua
1710030303	Elk Creek	Umpqua
1710030304	Middle Umpqua River	Umpqua
1710030305	Lake Creek	Umpqua
1710030306	Upper Smith River	Umpqua
1710030307	Lower Smith River	Umpqua
1710030308	Lower Umpqua River	Umpqua
1710030401	South Fork Coos	Coos
1710030402	Millicoma River	Coos
1710030403	Lakeside Frontal	Coos
1710030404	Coos Bay	Coos
1710030501	Coquille S Fk, Lwr	Coquille
1710030502	Middle Fork Coquille	Coquille
1710030503	Middle Main Coquille	Coquille
1710030504	East Fork Coquille	Coquille
1710030505	North Fork Coquille	Coquille
1710030506	Lower Coquille	Coquille
1710030603	Sixes River	Sixes
1710030604	New River Frontal	Sixes

Hood Canal summer-run chum salmon ESU*

Watershed	Watershed Name	Subbasin
1711001701	North/South Fork Skokomish	Skokomish
1711001802	Lower West Hood Canal Frontal	Hood Canal
1711001803	Hamma Hamma River	Hood Canal
1711001804	Duckabush River	Hood Canal
1711001805	Dosewallips River	Hood Canal
1711001806	Big Quilcene River	Hood Canal
1711001807	Upper West Hood Canal Frontal	Hood Canal
1711001808	West Kitsap	Hood Canal
1711001908	Port Ludlow/Chimacum Creek	Puget Sound
1711002001	Discovery Bay	Dungeness/Elwha
1711002002	Sequim Bay	Dungeness/Elwha
1711002003	Dungeness River	Dungeness/Elwha
N15	Kitsap	WRIA15
N16	Kennedy-Goldsborough	WRIA14
N17	Skokomish-Dosewallips	WRIA16
N18	Quilcene-Snow	WRIA17
N19	Elwah-Dungeness	WRIA18

* Watersheds beginning with "N" are nearshore marine areas ((see the discussion of these areas on p. 2-6). The watershed and subbasin names are taken from the Water Resource Inventory Area names and numbers.

Columbia River chum salmon ESU

Watershed	Watershed Name	Subbasin
1707010509	White Salmon River	Middle Columbia/Hood
1707010512	Middle Columbia/Grays Creek	Middle Columbia/Hood
1707010513	Middle Columbia/Eagle Creek	Middle Columbia/Hood
1708000106	Washougal River	Lower Columbia/Sandy
1708000107	Columbia Gorge Tributaries	Lower Columbia/Sandy
1708000109	Salmon Creek	Lower Columbia/Sandy
1708000205	East Fork Lewis River	Lewis
1708000206	Lower Lewis River	Lewis
1708000301	Kalama River	Lower Columbia/Clatskanie
1708000304	Germany/Abernathy	Lower Columbia/Clatskanie
1708000305	Skamokawa/Elochoman	Lower Columbia/Clatskanie
1708000503	Jackson Prairie	Cowlitz
1708000504	North Fork Toutle River	Cowlitz
1708000505	Green River	Cowlitz
1708000506	South Fork Toutle River	Cowlitz
1708000507	East Willapa	Cowlitz

Columbia River chum salmon ESU

Watershed	Watershed Name	Subbasin
1708000508	Coweeman	Cowlitz
1708000602	Big Creek	Lower Columbia
1708000603	Grays Bay	Grays/Elokoman

Ozette Lake sockeye ESU

Watershed	Watershed Name	Subbasin
1710010102	Ozette Lake	Hoh/Quillayute

Upper Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1702000503	Foster Creek	Chief Joseph
1702000504	Jordan/Tumwater	Chief Joseph
1702000505	Upper Columbia/Swamp Creek	Chief Joseph
1702000601	Upper Okanogan River	Okanogan
1702000602	Okanogan River/Bonaparte Creek	Okanogan
1702000603	Salmon Creek	Okanogan
1702000604	Okanogan River/Omak Creek	Okanogan
1702000605	Lower Okanogan River	Okanogan
1702000704	Lower Silkameen River	Similkameen
1702000801	Lost River	Methow
1702000802	Upper Methow River	Methow
1702000803	Upper Chewuch River	Methow
1702000804	Lower Chewuch River	Methow
1702000805	Twisp River	Methow
1702000806	Middle Methow River	Methow
1702000807	Lower Methow River	Methow
1702000903	Lower Chelan	Lake Chelan
1702001001	Entiat River	Upper Columbia/Entiat
1702001002	Lake Entiat	Upper Columbia/Entiat
1702001003	Columbia River/Lynch Coulee	Upper Columbia/Entiat
1702001004	Columbia River/Sand Hollow	Upper Columbia/Entiat
1702001101	White River	Wenatchee
1702001102	Chiawa River	Wenatchee
1702001103	Nason/Tumwater	Wenatchee
1702001104	Icicle/Chumstick	Wenatchee
1702001105	Lower Wenatchee River	Wenatchee
1702001204	Rattlesnake Creek	Moses Coulee
1702001509	Lower Crab Creek	Lower Crab

Upper Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1702001604	Yakima River/Hanson Creek	Upper Columbia/Priest Rapids
1702001605	Middle Columbia/Priest Rapids	Upper Columbia/Priest Rapids
1702001606	Columbia River/Zintel Canyon	Upper Columbia/Priest Rapids
1707010101	Upper Lake Wallula	Middle Columbia/Lake Wallula
1707010102	Lower Lake Wallula	Middle Columbia/Lake Wallula
1707010106	Upper Lake Umatilla	Middle Columbia/Lake Wallula
1707010109	Middle Lake Umatilla	Middle Columbia/Lake Wallula
1707010114	Lower Lake Umatilla	Middle Columbia/Lake Wallula
1707010501	Upper Middle Columbia/Hood	Middle Columbia/Hood
1707010504	Middle Columbia/Mill Creek	Middle Columbia/Hood
1707010512	Middle Columbia/Grays Creek	Middle Columbia/Hood
1707010513	Middle Columbia/Eagle Creek	Middle Columbia/Hood
1708000107	Columbia Gorge Tributaries	Lower Columbia/Sandy

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1702001606	Columbia River/Zintel Canyon	Upper Columbia/Priest Rapids
1706010101	Snake River/Granite Creek	Hells Canyon
1706010102	Snake River/Getta Creek	Hells Canyon
1706010104	Snake River/Divide Creek	Hells Canyon
1706010201	Upper Imnaha River	Imnaha River
1706010202	Middle Imnaha River	Imnaha River
1706010203	Big Sheep Creek	Imnaha River
1706010204	Little Sheep Creek	Imnaha River
1706010205	Lower Imnaha River	Imnaha River
1706010301	Snake River/Rogersburg	Lower Snake/Asotin
1706010302	Asotin River	Lower Snake/Asotin
1706010303	Snake River/Captain John Creek	Lower Snake/Asotin
1706010401	Upper Grande Ronde River	Upper Grande Ronde River
1706010402	Meadow Creek	Upper Grande Ronde River
1706010403	Grande Ronde River/Beaver Creek	Upper Grande Ronde River
1706010404	Grande Ronde River/Five Points Creek	Upper Grande Ronde River
1706010405	Catherine Creek	Upper Grande Ronde River
1706010406	Ladd Creek	Upper Grande Ronde River
1706010407	Grande Ronde River/Mill Creek	Upper Grande Ronde River
1706010408	Phillips Creek/Willow Creek	Upper Grande Ronde River
1706010409	Grande Ronde River/Indian Creek	Upper Grande Ronde River
1706010410	Lookingglass Creek	Upper Grande Ronde River
1706010411	Grande Ronde River/Cabin Creek	Upper Grande Ronde River
1706010501	Upper Wallowa River	Wallowa River

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1706010502	Lostine River	Wallowa River
1706010503	Middle Wallowa River	Wallowa River
1706010504	Bear Creek	Wallowa River
1706010505	Minam River	Wallowa River
1706010506	Lower Wallowa River	Wallowa River
1706010601	Grande Ronde River/Rondowa	Lower Grande Ronde
1706010602	Grande Ronde River/Mud Creek	Lower Grande Ronde
1706010603	Weneha River	Lower Grande Ronde
1706010604	Chesnimnus Creek	Lower Grande Ronde
1706010605	Upper Joseph Creek	Lower Grande Ronde
1706010606	Lower Joseph Creek	Lower Grande Ronde
1706010607	Lower Grande Ronde River/Menatche Creek	Lower Grande Ronde
1706010701	Alpowa Creek	Lower Snake/Tucannon
1706010702	Snake River/Steptoe Canyon	Lower Snake/Tucannon
1706010703	Deadman Creek	Lower Snake/Tucannon
1706010704	Flat Creek	Lower Snake/Tucannon
1706010705	Pataha Creek	Lower Snake/Tucannon
1706010706	Upper Tucannon River	Lower Snake/Tucannon
1706010707	Lower Tucannon River	Lower Snake/Tucannon
1706010708	Snake River/Penawawa Creek	Lower Snake/Tucannon
1706010808	Lower Palouse River	Palouse River
1706011001	Snake River/Walker Creek	Lower Snake River
1706011003	Snake River/Mc Coy Creek	Lower Snake River
1706011004	Mouth of Snake River	Lower Snake River
1706020101	Salmon River/Challis	Upper Salmon
1706020104	Salmon River/Bayhorse Creek	Upper Salmon
1706020105	East Fork Salmon River/Mcdonald Creek	Upper Salmon
1706020107	Road Creek	Upper Salmon
1706020108	Herd Creek	Upper Salmon
1706020109	East Fork Salmon River/Big Boulder Creek	Upper Salmon
1706020110	Upper East Fork Salmon River	Upper Salmon
1706020111	Germania Creek	Upper Salmon
1706020112	Salmon River/Kinnikinic Creek	Upper Salmon
1706020113	Salmon River/Slate Creek	Upper Salmon
1706020114	Warm Springs Creek	Upper Salmon
1706020115	Salmon River/Big Casino Creek	Upper Salmon
1706020117	Salmon River/Fisher Creek	Upper Salmon
1706020118	Salmon River/Fourth of July Creek	Upper Salmon

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1706020119	Upper Salmon River	Upper Salmon
1706020120	Alturas Lake Creek	Upper Salmon
1706020121	Redfish Lake Creek	Upper Salmon
1706020122	Valley Creek/Iron Creek	Upper Salmon
1706020123	Upper Valley Creek	Upper Salmon
1706020124	Basin Creek	Upper Salmon
1706020125	Yankee Fork/Jordan Creek	Upper Salmon
1706020126	West Fork Yankee Fork	Upper Salmon
1706020127	Upper Yankee Fork	Upper Salmon
1706020128	Squaw Creek	Upper Salmon
1706020129	Garden Creek	Upper Salmon
1706020130	Challis Creek/Mill Creek	Upper Salmon
1706020132	Morgan Creek	Upper Salmon
1706020201	Lower Pahsimeroi River	Pahsimeroi
1706020202	Pahsimeroi River/Falls Creek	Pahsimeroi
1706020203	Paterson Creek	Pahsimeroi
1706020301	Salmon River/Colson Creek	Middle Salmon-Panther
1706020302	Owl Creek	Middle Salmon-Panther
1706020303	Salmon River/Pine Creek	Middle Salmon-Panther
1706020304	Indian Creek	Middle Salmon-Panther
1706020305	Salmon River/Moose Creek	Middle Salmon-Panther
1706020306	North Fork Salmon River	Middle Salmon-Panther
1706020307	Salmon River/Tower Creek	Middle Salmon-Panther
1706020308	Carmen Creek	Middle Salmon-Panther
1706020309	Salmon River/Jesse Creek	Middle Salmon-Panther
1706020310	Salmon River/Williams Creek	Middle Salmon-Panther
1706020311	Salmon River/Twelvemile Creek	Middle Salmon-Panther
1706020312	Salmon River/Cow Creek	Middle Salmon-Panther
1706020313	Hat Creek	Middle Salmon-Panther
1706020314	Iron Creek	Middle Salmon-Panther
1706020315	Upper Panther Creek	Middle Salmon-Panther
1706020316	Moyer Creek	Middle Salmon-Panther
1706020317	Panther Creek/Woodtick Creek	Middle Salmon-Panther
1706020318	Deep Creek	Middle Salmon-Panther
1706020319	Napias Creek	Middle Salmon-Panther
1706020320	Panther Creek/Spring Creek	Middle Salmon-Panther
1706020321	Big Deer Creek	Middle Salmon-Panther
1706020322	Panther Creek/Trail Creek	Middle Salmon-Panther
1706020323	Clear Creek	Middle Salmon-Panther
1706020401	Lemhi River/Bohannon Creek	Lemhi
1706020402	Lemhi River/Whimpey Creek	Lemhi

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1706020403	Lemhi River/Kenney Creek	Lemhi
1706020404	Agency Creek	Lemhi
1706020405	Lemhi River/Mcdevitt Creek	Lemhi
1706020406	Lemhi River/Yearian Creek	Lemhi
1706020407	Peterson Creek	Lemhi
1706020408	Big Eight Mile Creek	Lemhi
1706020409	Canyon Creek	Lemhi
1706020414	Hayden Creek	Lemhi
1706020501	Lower Loon Creek	Upper Middle Fork Salmon
1706020502	Warm Springs	Upper Middle Fork Salmon
1706020503	Upper Loon Creek	Upper Middle Fork Salmon
1706020504	Little Loon Creek	Upper Middle Fork Salmon
1706020505	Rapid River	Upper Middle Fork Salmon
1706020506	Marsh Creek	Upper Middle Fork Salmon
1706020507	Middle Fork Salmon River/Soldier Creek	Upper Middle Fork Salmon
1706020508	Bear Valley Creek	Upper Middle Fork Salmon
1706020509	Sulphur Creek	Upper Middle Fork Salmon
1706020510	Pistol Creek	Upper Middle Fork Salmon
1706020511	Indian Creek	Upper Middle Fork Salmon
1706020512	Upper Marble Creek	Upper Middle Fork Salmon
1706020513	Middle Fork Salmon River/Lower Marble Creek	Upper Middle Fork Salmon
1706020601	Lower Middle Fork Salmon River	Lower Middle Fork Salmon
1706020602	Wilson Creek	Lower Middle Fork Salmon
1706020603	Middle Fork Salmon River/Brush Creek	Lower Middle Fork Salmon
1706020604	Yellow Jacket Creek	Lower Middle Fork Salmon
1706020605	Silver Creek	Lower Middle Fork Salmon
1706020606	Upper Camas Creek	Lower Middle Fork Salmon
1706020607	West Fork Camas Creek	Lower Middle Fork Salmon
1706020608	Lower Camas Creek	Lower Middle Fork Salmon
1706020609	Middle Fork Salmon River/Sheep Creek	Lower Middle Fork Salmon
1706020610	Rush Creek	Lower Middle Fork Salmon
1706020611	Monumental Creek	Lower Middle Fork Salmon
1706020612	Big Creek/Little Marble Creek	Lower Middle Fork Salmon
1706020613	Upper Big Creek	Lower Middle Fork Salmon
1706020614	Beaver Creek	Lower Middle Fork Salmon
1706020615	Big Ramey Creek	Lower Middle Fork Salmon
1706020616	Big Creek/Crooked Creek	Lower Middle Fork Salmon
1706020617	Lower Big Creek	Lower Middle Fork Salmon
1706020701	Salmon River/Fall Creek	Middle Salmon-Chamberlain

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1706020702	Wind River	Middle Salmon-Chamberlain
1706020703	Salmon River/California Creek	Middle Salmon-Chamberlain
1706020704	Sheep Creek	Middle Salmon-Chamberlain
1706020705	Crooked Creek	Middle Salmon-Chamberlain
1706020706	Salmon River/Rabbit Creek	Middle Salmon-Chamberlain
1706020707	Big Mallard Creek	Middle Salmon-Chamberlain
1706020708	Salmon River/Trout Creek	Middle Salmon-Chamberlain
1706020709	Bargamin Creek	Middle Salmon-Chamberlain
1706020710	Salmon River/Rattlesnake Creek	Middle Salmon-Chamberlain
1706020711	Sabe Creek	Middle Salmon-Chamberlain
1706020712	Salmon River/Hot Springs Creek	Middle Salmon-Chamberlain
1706020713	Salmon River/Disappointment Creek	Middle Salmon-Chamberlain
1706020714	Horse Creek	Middle Salmon-Chamberlain
1706020715	Salmon River/Kitchen Creek	Middle Salmon-Chamberlain
1706020716	Cottonwood Creek	Middle Salmon-Chamberlain
1706020717	Lower Chamberlain/Mccalla Creek	Middle Salmon-Chamberlain
1706020718	Upper Chamberlain Creek	Middle Salmon-Chamberlain
1706020719	Warren Creek	Middle Salmon-Chamberlain
1706020801	Lower South Fork Salmon River	South Fork Salmon
1706020802	South Fork Salmon River/Sheep Creek	South Fork Salmon
1706020803	Lower East Fork South Fork Salmon River	South Fork Salmon
1706020804	Upper East Fork South Fork Salmon River	South Fork Salmon
1706020805	Lower Johnson Creek	South Fork Salmon
1706020806	Burntlog Creek	South Fork Salmon
1706020807	Upper Johnson Creek	South Fork Salmon
1706020808	Upper South Fork Salmon River	South Fork Salmon
1706020809	South Fork Salmon River/Cabin Creek	South Fork Salmon
1706020810	South Fork Salmon River/Blackmare Creek	South Fork Salmon
1706020811	Buckhorn Creek	South Fork Salmon
1706020812	South Fork Salmon River/Fitsum Creek	South Fork Salmon
1706020813	Lower Secesh River	South Fork Salmon
1706020814	Middle Secesh River	South Fork Salmon
1706020815	Upper Secesh River	South Fork Salmon
1706020901	Salmon River/China Creek	Lower Salmon
1706020902	Eagle Creek	Lower Salmon
1706020903	Deer Creek	Lower Salmon
1706020904	Salmon River/Cottonwood Creek	Lower Salmon
1706020905	Salmon River/Deep Creek	Lower Salmon

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1706020906	Rock Creek	Lower Salmon
1706020907	Salmon River/Hammer Creek	Lower Salmon
1706020908	White Bird Creek	Lower Salmon
1706020909	Salmon River/Mckinzie Creek	Lower Salmon
1706020910	Skookumchuck Creek	Lower Salmon
1706020911	Slate Creek	Lower Salmon
1706020912	Salmon River/John Day Creek	Lower Salmon
1706020913	Salmon River/Lake Creek	Lower Salmon
1706020914	Salmon River/Van Creek	Lower Salmon
1706020915	French Creek	Lower Salmon
1706020916	Partridge Creek	Lower Salmon
1706020917	Rice Creek	Lower Salmon
1706021001	Lower Little Salmon River	Little Salmon
1706021002	Little Salmon River/Hard Creek	Little Salmon
1706021003	Hazard Creek	Little Salmon
1706021006	Boulder Creek	Little Salmon
1706021007	Rapid River	Little Salmon
1706030101	Selway River/Pettibone Creek	Upper Selway
1706030102	Bear Creek	Upper Selway
1706030103	Selway River/Gardner Creek	Upper Selway
1706030104	White Cap Creek	Upper Selway
1706030105	Indian Creek	Upper Selway
1706030106	Upper Selway River	Upper Selway
1706030107	Little Clearwater River	Upper Selway
1706030108	Running Creek	Upper Selway
1706030109	Goat Creek	Upper Selway
1706030201	Selway River/Goddard Creek	Lower Selway
1706030202	Gedney Creek	Lower Selway
1706030203	Selway River/Three Links Creek	Lower Selway
1706030204	Upper Three Links Creek	Lower Selway
1706030205	Rhoda Creek	Lower Selway
1706030207	North Fork Moose Creek	Lower Selway
1706030208	East Fork Moose Creek/Trout Creek	Lower Selway
1706030209	Upper East Fork Moose Creek	Lower Selway
1706030210	Marten Creek	Lower Selway
1706030211	Upper Meadow Creek	Lower Selway
1706030212	Middle Meadow Creek	Lower Selway
1706030213	Lower Meadow Creek	Lower Selway
1706030214	O'hara Creek	Lower Selway
1706030301	Lower Lochsa River	Lochsa
1706030302	Fish Creek	Lochsa

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1706030303	Lochsa River/Stanley Creek	Lochsa
1706030304	Lochsa River/Squaw Creek	Lochsa
1706030305	Lower Crooked Fork	Lochsa
1706030306	Upper Crooked Fork	Lochsa
1706030307	Brushy Fork	Lochsa
1706030308	Lower White Sands Creek	Lochsa
1706030309	Storm Creek	Lochsa
1706030310	Upper White Sands Creek	Lochsa
1706030311	Warm Springs Creek	Lochsa
1706030312	Fish Lake Creek	Lochsa
1706030313	Boulder Creek	Lochsa
1706030314	Old Man Creek	Lochsa
1706030401	Middle Fork Clearwater River/Maggie Creek	Middle Fork Clearwater
1706030402	Clear Creek	Middle Fork Clearwater
1706030501	Lower South Fork Clearwater River	South Fork Clearwater
1706030502	South Fork Clearwater River/Meadow Creek	South Fork Clearwater
1706030503	South Fork Clearwater River/Peasley Creek	South Fork Clearwater
1706030504	South Fork Clearwater River/Leggett Creek	South Fork Clearwater
1706030505	Newsome Creek	South Fork Clearwater
1706030506	American River	South Fork Clearwater
1706030507	Red River	South Fork Clearwater
1706030508	Crooked River	South Fork Clearwater
1706030509	Ten Mile Creek	South Fork Clearwater
1706030510	John's Creek	South Fork Clearwater
1706030511	Mill Creek	South Fork Clearwater
1706030512	Three Mile Creek	South Fork Clearwater
1706030513	Cottonwood Creek	South Fork Clearwater
1706030601	Lower Clearwater River	Clearwater
1706030602	Clearwater River/Lower Potlatch River	Clearwater
1706030603	Potlatch River/Middle Potlatch Creek	Clearwater
1706030604	Lower Big Bear Creek	Clearwater
1706030606	Potlatch River/Pine Creek	Clearwater
1706030607	Upper Potlatch River	Clearwater
1706030608	Clearwater River/Bedrock Creek	Clearwater
1706030609	Clearwater River/Jack's Creek	Clearwater
1706030610	Big Canyon Creek	Clearwater
1706030611	Little Canyon Creek	Clearwater

Snake River Basin O. mykiss ESU

Watershed	Watershed Name	Subbasin
1706030612	Clearwater River/Lower Orofino Creek	Clearwater
1706030613	Upper Orofino Creek	Clearwater
1706030614	Jim Ford Creek	Clearwater
1706030615	Lower Lolo Creek	Clearwater
1706030616	Middle Lolo Creek	Clearwater
1706030617	Musselshell Creek	Clearwater
1706030618	Upper Lolo Creek	Clearwater
1706030619	Eldorado Creek	Clearwater
1706030620	Clearwater River/Fivemile Creek	Clearwater
1706030621	Clearwater River/Sixmile Creek	Clearwater
1706030622	Clearwater River/Tom Taha Creek	Clearwater
1706030623	Lower Lawyer Creek	Clearwater
1706030624	Middle Lawyer Creek	Clearwater
1706030627	Cottonwood Creek	Clearwater
1706030630	Upper Sweetwater Creek	Clearwater
1706030631	Lower Sweetwater Creek	Clearwater
1706030801	Lower North Fork Clearwater River	Lower North Fork Clearwater
1707010101	Upper Lake Wallula	Middle Columbia/Lake Wallula
1707010102	Lower Lake Wallula	Middle Columbia/Lake Wallula
1707010106	Upper Lake Umatilla	Middle Columbia/Lake Wallula
1707010109	Middle Lake Umatilla	Middle Columbia/Lake Wallula
1707010114	Lower Lake Umatilla	Middle Columbia/Lake Wallula
1707010501	Upper Middle Columbia/Hood	Middle Columbia/Hood
1707010504	Middle Columbia/Mill Creek	Middle Columbia/Hood
1707010512	Middle Columbia/Grays Creek	Middle Columbia/Hood
1707010513	Middle Columbia/Eagle Creek	Middle Columbia/Hood
1708000107	Columbia Gorge Tributaries	Lower Columbia/Sandy

Lower Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1707010506	East Fork Hood River	Middle Columbia/Hood
1707010507	West Fork Hood River	Middle Columbia/Hood
1707010508	Hood River	Middle Columbia/Hood
1707010511	Wind River	Middle Columbia/Hood
1707010512	Middle Columbia/Grays Creek	Middle Columbia/Hood
1707010513	Middle Columbia/Eagle Creek	Middle Columbia/Hood
1708000101	Salmon River	Lower Columbia/Sandy
1708000102	Zigzag River	Lower Columbia/Sandy
1708000103	Upper Sandy River	Lower Columbia/Sandy
1708000104	Middle Sandy River	Lower Columbia/Sandy

Lower Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1708000105	Bull Run River	Lower Columbia/Sandy
1708000106	Washougal River	Lower Columbia/Sandy
1708000107	Columbia Gorge Tributaries	Lower Columbia/Sandy
1708000108	Lower Sandy River	Lower Columbia/Sandy
1708000109	Salmon Creek	Lower Columbia/Sandy
1708000205	East Fork Lewis River	Lewis
1708000206	Lower Lewis River	Lewis
1708000301	Kalama River	Lower Columbia/Clatskanie
1708000401	Headwaters Cowlitz River	Upper Cowlitz
1708000402	Upper Cowlitz River	Upper Cowlitz
1708000403	Cowlitz Valley Frontal	Upper Cowlitz
1708000404	Upper Cispus River	Upper Cowlitz
1708000405	Lower Cispus River	Upper Cowlitz
1708000501	Tilton River	Cowlitz
1708000502	Riffe Reservoir	Cowlitz
1708000503	Jackson Prairie	Cowlitz
1708000504	North Fork Toutle River	Cowlitz
1708000505	Green River	Cowlitz
1708000506	South Fork Toutle River	Cowlitz
1708000507	East Willapa	Cowlitz
1708000508	Coweeman	Cowlitz
1709000704	Abernethy Creek	Middle Willamette
1709001101	Collawash River	Clackamas
1709001102	Upper Clackamas River	Clackamas
1709001103	Oak Grove Fork Clackamas River	Clackamas
1709001104	Middle Clackamas River	Clackamas
1709001105	Eagle Creek	Clackamas
1709001106	Lower Clackamas River	Clackamas
1709001201	Johnson Creek	Lower Willamette
1709001202	Scappoose Creek	Lower Willamette
1709001203	Columbia Slough/Willamette River	Lower Willamette

Upper Willamette O. mykiss ESU

Watershed	Watershed Name	Subbasin
1709000303	Calapooia River	Upper Willamette
1709000304	Oak Creek	Upper Willamette
1709000306	Luckiamute River	Upper Willamette
1709000504	Middle North Santiam River	North Santiam
1709000505	Little North Santiam River	North Santiam
1709000506	Lower North Santiam River	North Santiam

Upper Willamette O. mykiss ESU

Watershed	Watershed Name	Subbasin
1709000601	Hamilton Creek/South Santiam River	South Santiam
1709000602	Crabtree Creek	South Santiam
1709000603	Thomas Creek	South Santiam
1709000606	South Santiam River	South Santiam
1709000607	South Santiam River / Foster Reservoir	South Santiam
1709000608	Wiley Creek	South Santiam
1709000701	Mill Creek/Willamette River	Middle Willamette
1709000702	Rickreall Creek	Middle Willamette
1709000703	Willamette River/Chehalem Creek	Middle Willamette
1709000704	Abernethy Creek	Middle Willamette
1709000801	Upper South Yamhill River	Yamhill
1709000802	Willamina Creek	Yamhill
1709000803	Mill Creek/South Yamhill River	Yamhill
1709000804	Lower South Yamhill River	Yamhill
1709000805	Salt Creek/South Yamhill River	Yamhill
1709000806	North Yamhill River	Yamhill
1709000807	Yamhill River	Yamhill
1709000901	Abiqua Creek/Pudding River	Molalla/Pudding
1709000902	Butte Creek/Pudding River	Molalla/Pudding
1709000903	Rock Creek/Pudding River	Molalla/Pudding
1709000904	Senecal Creek/Mill Creek	Molalla/Pudding
1709000905	Upper Molalla River	Molalla/Pudding
1709000906	Lower Molalla River	Molalla/Pudding
1709001001	Dairy Creek	Tualatin
1709001002	Gales Creek	Tualatin
1709001003	Scoggins Creek	Tualatin
1709001004	Rock Creek/Tualatin River	Tualatin
1709001005	Lower Tualatin River	Tualatin
1709001201	Johnson Creek	Lower Willamette
1709001203	Columbia Slough/Willamette River	Lower Willamette

Middle Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1702001606	Columbia River/Zintel Canyon	Upper Columbia/Priest Rapids
1703000101	Upper Yakima River	Upper Yakima
1703000102	Tenaway River	Upper Yakima
1703000103	Middle Upper Yakima River	Upper Yakima
1703000104	Umtanum/Wenas	Upper Yakima
1703000201	Little Naches River	Naches
1703000202	Naches River/Rattlesnake Creek	Naches

Middle Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1703000203	Naches River/Tieton River	Naches
1703000301	Ahtanum Creek	Lower Yakima
1703000302	Upper Lower Yakima River	Lower Yakima
1703000303	Upper Toppenish Creek	Lower Yakima
1703000304	Lower Toppenish Creek	Lower Yakima
1703000305	Satus Creek	Lower Yakima
1703000306	Yakima River/Spring Creek	Lower Yakima
1703000307	Yakima River/Cold Creek	Lower Yakima
1707010101	Upper Lake Wallula	Middle Columbia/Lake Wallula
1707010102	Lower Lake Wallula	Middle Columbia/Lake Wallula
1707010105	Glade Creek	Middle Columbia/Lake Wallula
1707010106	Upper Lake Umatilla	Middle Columbia/Lake Wallula
1707010109	Middle Lake Umatilla	Middle Columbia/Lake Wallula
1707010110	Alder Creek	Middle Columbia/Lake Wallula
1707010111	Pine Creek	Middle Columbia/Lake Wallula
1707010112	Wood Gulch	Middle Columbia/Lake Wallula
1707010113	Rock Creek	Middle Columbia/Lake Wallula
1707010114	Lower Lake Umatilla	Middle Columbia/Lake Wallula
1707010201	Upper Walla Walla River	Walla Walla
1707010202	Mill Creek	Walla Walla
1707010203	Upper Touchet River	Walla Walla
1707010204	Middle Touchet River	Walla Walla
1707010207	Lower Touchet River	Walla Walla
1707010208	Cottonwood Creek	Walla Walla
1707010209	Pine Creek	Walla Walla
1707010210	Dry Creek	Walla Walla
1707010211	Lower Walla Walla River	Walla Walla
1707010301	Upper Umatilla River	Umatilla
1707010302	Meacham Creek	Umatilla
1707010303	Umatilla River/Mission Creek	Umatilla
1707010304	Wildhorse Creek	Umatilla
1707010305	Mckay Creek	Umatilla
1707010306	Birch Creek	Umatilla
1707010307	Umatilla River/Alkali Canyon	Umatilla
1707010308	Stage Gulch	Umatilla
1707010310	Lower Butter Creek	Umatilla
1707010313	Lower Umatilla River	Umatilla
1707010501	Upper Middle Columbia/Hood	Middle Columbia/Hood
1707010502	Fifteenmile Creek	Middle Columbia/Hood
1707010503	Fivemile Creek	Middle Columbia/Hood
1707010504	Middle Columbia/Mill Creek	Middle Columbia/Hood

Middle Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1707010505	Mosier Creek	Middle Columbia/Hood
1707010512	Middle Columbia/Grays Creek	Middle Columbia/Hood
1707010513	Middle Columbia/Eagle Creek	Middle Columbia/Hood
1707010601	Upper Klickitat River	Klickitat
1707010602	Middle Klickitat River	Klickitat
1707010603	Little Klickitat River	Klickitat
1707010604	Lower Klickitat River	Klickitat
1707020103	Middle South Fork John Day	Upper John Day
1707020104	Murderers Creek	Upper John Day
1707020105	Lower South Fork John Day	Upper John Day
1707020106	Upper John Day River	Upper John Day
1707020107	Canyon Creek	Upper John Day
1707020108	Strawberry Creek	Upper John Day
1707020109	Beech Creek	Upper John Day
1707020110	Laycock Creek	Upper John Day
1707020111	Fields Creek	Upper John Day
1707020112	Upper Middle John Day	Upper John Day
1707020113	Mountain Creek	Upper John Day
1707020114	Rock Creek	Upper John Day
1707020115	John Day River/Johnson Creek	Upper John Day
1707020201	Upper North Fork John Day River	North Fork John Day
1707020202	Granite Creek	North Fork John Day
1707020203	North Fork John Day River/Big Creek	North Fork John Day
1707020204	Desolation Creek	North Fork John Day
1707020205	Upper Camas Creek	North Fork John Day
1707020206	Lower Camas Creek	North Fork John Day
1707020207	North Fork John Day River/Potamus Creek	North Fork John Day
1707020208	Wall Creek	North Fork John Day
1707020209	Cottonwood Creek	North Fork John Day
1707020210	Lower North Fork John Day River	North Fork John Day
1707020301	Upper Middle Fork John Day River	Middle Fork John Day
1707020302	Camp Creek	Middle Fork John Day
1707020303	Big Creek	Middle Fork John Day
1707020304	Long Creek	Middle Fork John Day
1707020305	Lower Middle Fork John Day River	Middle Fork John Day
1707020401	Lower John Day River/Kahler Creek	Lower John Day
1707020402	Lower John Day River/Service Creek	Lower John Day
1707020403	Bridge Creek	Lower John Day
1707020404	Lower John Day River/Muddy Creek	Lower John Day
1707020405	Lower John Day River/Clarno	Lower John Day

Middle Columbia River O. mykiss ESU

Watershed	Watershed Name	Subbasin
1707020406	Butte Creek	Lower John Day
1707020407	Pine Hollow	Lower John Day
1707020408	Thirtymile Creek	Lower John Day
1707020409	Lower John Day River/Ferry Canyon	Lower John Day
1707020410	Lower John Day River/Scott Canyon	Lower John Day
1707020411	Upper Rock Creek	Lower John Day
1707020412	Lower Rock Creek	Lower John Day
1707020413	Grass Valley Canyon	Lower John Day
1707020414	Lower John Day River/Mcdonald Ferry	Lower John Day
1707030603	Upper Deschutes River	Lower Deschutes
1707030604	Mill Creek	Lower Deschutes
1707030605	Beaver Creek	Lower Deschutes
1707030606	Warm Springs River	Lower Deschutes
1707030607	Middle Deschutes River	Lower Deschutes
1707030608	Bakeoven Creek	Lower Deschutes
1707030610	White River	Lower Deschutes
1707030611	Buck Hollow Creek	Lower Deschutes
1707030612	Lower Deschutes River	Lower Deschutes
1707030701	Upper Trout Creek	Trout
1707030702	Antelope Creek	Trout
1707030704	Mud Springs Creek	Trout
1707030705	Lower Trout Creek	Trout
1708000107	Columbia Gorge Tributaries	Lower Columbia/Sandy

Appendix B.1
County and ESU Demographics

Puget Sound chinook salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Washington	Chelan	66,616	0	2,921.0	0.1	22.8	0.0
	Clallam	64,525	46,850	1,739.0	511.4	37.1	91.6
	Island	71,558	1,632	208.0	11.2	344.0	145.7
	Jefferson	25,953	2,029	1,814.0	497.0	14.3	4.1
	King	1,737,034	1,725,707	2,126.0	1999.1	817.0	863.3
	Kitsap	231,969	231,936	396.0	403.7	585.8	574.5
	Kittitas	33,362	0	2,297.0	0.0	14.5	0.0
	Lewis	68,600	0	2,408.0	30.8	28.5	0.0
	Mason	49,405	46,496	961.0	734.1	51.4	63.3
	Pierce	700,820	349,859	1,679.0	1361.4	417.4	257.0
	San Juan	14,077	1,050	175.0	12.0	80.4	87.6
	Skagit	102,979	102,481	1,735.0	1627.4	59.4	63.0
	Snohomish	606,024	596,138	2,089.0	2077.8	290.1	286.9
	Thurston	207,355	177,209	727.0	406.3	285.2	436.2
	Whatcom	166,814	157,276	2,120.0	1364.3	78.7	115.3
Total		4,147,091	3,438,663	23,395.0	11036.6	177.3	311.6

Lower Columbia River chinook salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Clackamas	338,391	282,236	1,868.0	810.2	181.2	348.4
	Clatsop	35,630	23,146	827.0	355.1	43.1	65.2
	Columbia	43,560	39,692	657.0	407.6	66.3	97.4
	Hood River	20,411	20,093	522.0	451.7	39.1	44.5
	Marion	284,834	1,547	1,184.0	10.3	240.6	150.7
	Multnomah	660,486	624,895	435.0	423.3	1518.4	1476.3
	Wasco	23,791	709	2,381.0	14.7	10.0	48.2
	Washington	445,342	2,063	724.0	11.7	615.1	176.3
	Yamhill	84,992	374	716.0	4.6	118.7	81.7
Washington	Clark	345,238	345,238	628.0	633.0	549.7	545.4
	Cowlitz	92,948	92,803	1,139.0	1111.2	81.6	83.5
	Klickitat	19,161	6,844	1,872.0	272.1	10.2	25.2
	Lewis	68,600	22,282	2,408.0	1435.9	28.5	15.5
	Pacific	20,984	1,076	933.0	108.0	22.5	10.0

Lower Columbia River chinook salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Washington, cont.	Pierce	700,820	0	1,679.0	62.5	417.4	0.0
	Skamania	9,872	9,859	1,656.0	1124.5	6.0	8.8
	Wahkiakum	3,824	2,943	264.0	252.0	14.5	11.7
	Yakima	222,581	0	4,296.0	63.3	51.8	0.0
Total		3,421,465	1,475,800	24,189.0	7551.5	141.4	195.4

Upper Willamette River chinook salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Benton	78,153	77,117	676.0	496.3	115.6	155.4
	Clackamas	338,391	303,561	1,868.0	1490.1	181.2	203.7
	Douglas	100,399	0	5,037.0	101.4	19.9	0.0
	Lane	322,959	306,065	4,554.0	3507.0	70.9	87.3
	Lincoln	44,479	84	980.0	12.2	45.4	6.9
	Linn	103,069	102,942	2,292.0	1770.1	45.0	58.2
	Marion	284,834	284,283	1,184.0	1008.2	240.6	282.0
	Multnomah	660,486	575,855	435.0	163.2	1518.4	3529.5
	Polk	62,380	59,203	741.0	511.6	84.2	115.7
	Washington	445,342	2,038	724.0	6.1	615.1	336.6
	Yamhill	84,992	80,706	716.0	495.6	118.7	162.8
Total		2,525,484	1,791,854	19,207.0	9561.8	131.5	187.4

Upper Columbia River spring-run chinook salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Gilliam	1,915	577	1,204.0	165.4	1.6	3.5
	Hood River	20,411	3,799	522.0	123.1	39.1	30.9
	Morrow	10,995	7,700	2,032.0	211.2	5.4	36.5
	Multnomah	660,486	1,067	435.0	76.9	1518.4	13.9
	Sherman	1,934	909	823.0	118.9	2.3	7.6
	Umatilla	70,548	6,684	3,215.0	149.6	21.9	44.7
	Wasco	23,791	18,610	2,381.0	147.5	10.0	126.1
Washington	Adams	16,428	89	1,925.0	15.3	8.5	5.8
	Benton	142,475	89,810	1,703.0	550.3	83.7	163.2

Upper Columbia River spring-run chinook salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	**County**	**County**	**ESU**	**County**	**ESU**	**County**	**ESU**
Washington, cont.	Chelan	66,616	58,315	2,921.0	2062.0	22.8	28.3
	Clark	345,238	6,213	628.0	19.7	549.7	314.7
	Douglas	32,603	27,404	1,821.0	369.7	17.9	74.1
	Franklin	49,347	12,873	1,242.0	195.9	39.7	65.7
	Grant	74,698	6,958	2,681.0	467.3	27.9	14.9
	Kittitas	33,362	174	2,297.0	404.1	14.5	0.4
	Klickitat	19,161	6,730	1,872.0	332.6	10.2	20.2
	Okanogan	39,564	9,436	5,268.0	1950.0	7.5	4.8
	Skamania	9,872	4,933	1,656.0	153.6	6.0	32.1
	Walla Walla	55,180	2,901	1,271.0	139.9	43.4	20.7
	Yakima	222,581	3	4,296.0	80.1	51.8	0.0
Total		1,897,205	265,185	40,193.0	7733.2	47.2	34.3

Oregon Coast coho salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	**County**	**County**	**ESU**	**County**	**ESU**	**County**	**ESU**
Oregon	Benton	78,153	1,036	676.0	182.7	115.6	5.7
	Clatsop	35,630	12,415	827.0	458.0	43.1	27.1
	Columbia	43,560	3,922	657.0	252.1	66.3	15.6
	Coos	62,779	62,779	1,600.0	1606.6	39.2	39.1
	Curry	21,137	855	1,627.0	226.8	13.0	3.8
	Douglas	100,399	100,002	5,037.0	4361.9	19.9	22.9
	Jackson	181,269	0	2,785.0	2.7	65.1	0.0
	Josephine	75,726	0	1,640.0	5.4	46.2	0.0
	Lane	322,959	16,894	4,554.0	1110.5	70.9	15.2
	Lincoln	44,479	44,322	980.0	960.8	45.4	46.1
	Polk	62,380	10	741.0	39.8	84.2	0.3
	Tillamook	24,262	24,262	1,102.0	1094.2	22.0	22.2
	Washington	445,342	193	724.0	80.9	615.1	2.4
	Yamhill	84,992	0	716.0	59.6	118.7	0.0
Total		1,583,067	266,690	23,666.0	10442.3	66.9	25.5

Hood Canal summer-run chum salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Washington	Clallam	64,525	20,756	1,739.0	250.3	37.1	82.9
	Jefferson	25,953	25,345	1,814.0	615.9	14.3	41.2
	Kitsap	231,969	22,301	396.0	130.7	585.8	170.6
	Mason	49,405	11,023	961.0	464.3	51.4	23.7
Total		371,852	79,425	4,910.0	1461.3	75.7	54.4

Columbia River chum salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Clatsop	35,630	10,146	827.0	116.4	43.1	87.2
	Hood River	20,411	3,799	522.0	111.4	39.1	34.1
	Multnomah	660,486	1,067	435.0	76.9	1518.4	13.9
	Wasco	23,791	709	2,381.0	14.7	10.0	48.2
Washington	Clark	345,238	345,238	628.0	633.0	549.7	545.4
	Cowlitz	92,948	92,803	1,139.0	1111.2	81.6	83.5
	Klickitat	19,161	6,844	1,872.0	263.2	10.2	26.0
	Lewis	68,600	12,632	2,408.0	337.9	28.5	37.4
	Pacific	20,984	1,076	933.0	108.0	22.5	10.0
	Skamania	9,872	7,065	1,656.0	569.2	6.0	12.4
	Wahkiakum	3,824	2,943	264.0	252.0	14.5	11.7
	Yakima	222,581	0	4,296.0	38.6	51.8	0.0
Total		1,523,526	484,322	17,361.0	3632.5	87.8	133.3

Ozette Lake sockeye salmon ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Washington	Clallam	64,525	85	1,739.0	101.0	37.1	0.8
Total		64,525	85	1,739.0	101.0	37.1	0.8

Upper Columbia River O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Gilliam	1,915	577	1,204.0	165.4	1.6	3.5
	Hood River	20,411	3,799	522.0	123.1	39.1	30.9
	Morrow	10,995	7,700	2,032.0	211.2	5.4	36.5
	Multnomah	660,486	1,067	435.0	76.9	1518.4	13.9
	Sherman	1,934	909	823.0	118.9	2.3	7.6
	Umatilla	70,548	6,684	3,215.0	149.6	21.9	44.7
	Wasco	23,791	18,610	2,381.0	147.5	10.0	126.1
Washington	Adams	16,428	3,582	1,925.0	124.8	8.5	28.7
	Benton	142,475	89,810	1,703.0	550.3	83.7	163.2
	Chelan	66,616	66,512	2,921.0	2324.2	22.8	28.6
	Clark	345,238	6,213	628.0	19.7	549.7	314.7
	Douglas	32,603	30,537	1,821.0	935.1	17.9	32.7
	Franklin	49,347	12,873	1,242.0	195.9	39.7	65.7
	Grant	74,698	11,410	2,681.0	833.4	27.9	13.7
	Kittitas	33,362	174	2,297.0	404.1	14.5	0.4
	Klickitat	19,161	6,730	1,872.0	332.6	10.2	20.2
	Okanogan	39,564	35,192	5,268.0	3787.1	7.5	9.3
	Skamania	9,872	4,933	1,656.0	153.6	6.0	32.1
	Walla Walla	55,180	2,901	1,271.0	139.9	43.4	20.7
	Yakima	222,581	3	4,296.0	80.1	51.8	0.0
Total		1,897,205	310,216	40,193.0	10873.5	47.2	28.5

Snake River Basin O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Idaho	Adams	3,476	199	1,365.0	213.0	2.5	0.9
	Blaine	18,991	23	2,645.0	132.9	7.2	0.2
	Boise	6,670	0	1,902.0	1.1	3.5	0.0
	Clearwater	8,930	8,657	2,461.0	670.1	3.6	12.9
	Custer	4,342	2,705	4,925.0	2849.0	0.9	0.9
	Idaho	15,511	15,451	8,485.0	8214.2	1.8	1.9
	Latah	34,935	5,119	1,077.0	444.8	32.4	11.5
	Lemhi	7,806	7,679	4,564.0	3680.9	1.7	2.1
	Lewis	3,747	2,713	479.0	337.3	7.8	8.0
	Nez Perce	37,410	36,659	849.0	781.6	44.1	46.9
	Valley	7,651	75	3,678.0	2403.4	2.1	0.0

Snake River Basin O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Baker	16,741	0	3,068.0	7.6	5.5	0.0
	Gilliam	1,915	577	1,204.0	165.4	1.6	3.5
	Grant	7,935	0	4,529.0	0.2	1.8	0.0
	Hood River	20,411	3,799	522.0	123.1	39.1	30.9
	Morrow	10,995	7,700	2,032.0	211.2	5.4	36.5
	Multnomah	660,486	1,067	435.0	76.9	1518.4	13.9
	Sherman	1,934	909	823.0	118.9	2.3	7.6
	Umatilla	70,548	6,694	3,215.0	206.5	21.9	32.4
	Union	24,530	23,735	2,037.0	1735.0	12.0	13.7
	Wallowa	7,226	7,226	3,145.0	3081.7	2.3	2.3
	Wasco	23,791	18,610	2,381.0	147.5	10.0	126.1
Washington	Adams	16,428	34	1,925.0	24.2	8.5	1.4
	Asotin	20,551	20,551	635.0	630.7	32.4	32.6
	Benton	142,475	89,810	1,703.0	388.7	83.7	231.1
	Clark	345,238	6,213	628.0	19.7	549.7	314.7
	Columbia	4,064	348	869.0	472.7	4.7	0.7
	Franklin	49,347	13,089	1,242.0	381.8	39.7	34.3
	Garfield	2,397	2,397	711.0	718.3	3.4	3.3
	Klickitat	19,161	6,730	1,872.0	332.6	10.2	20.2
	Skamania	9,872	4,933	1,656.0	153.6	6.0	32.1
	Walla Walla	55,180	4,959	1,271.0	419.7	43.4	11.8
	Whitman	40,740	1,191	2,159.0	597.2	18.9	2.0
	Yakima	222,581	3	4,296.0	9.2	51.8	0.3
Total		1,924,015	299,855	74,788.0	29750.7	25.7	10.1

Lower Columbia River O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Clackamas	338,391	282,607	1,868.0	1379.9	181.2	204.8
	Columbia	43,560	21,765	657.0	139.0	66.3	156.5
	Hood River	20,411	20,093	522.0	451.7	39.1	44.5
	Marion	284,834	1,553	1,184.0	107.2	240.6	14.5
	Multnomah	660,486	624,895	435.0	423.3	1518.4	1476.3
	Wasco	23,791	709	2,381.0	14.7	10.0	48.2
	Washington	445,342	2,063	724.0	11.7	615.1	176.3
	Yamhill	84,992	374	716.0	4.6	118.7	81.7

Lower Columbia River O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Washington	Clark	345,238	345,238	628.0	633.0	549.7	545.4
	Cowlitz	92,948	49,998	1,139.0	986.4	81.6	50.7
	Klickitat	19,161	4,130	1,872.0	63.2	10.2	65.3
	Lewis	68,600	22,282	2,408.0	1430.4	28.5	15.6
	Pierce	700,820	0	1,679.0	62.5	417.4	0.0
	Skamania	9,872	8,952	1,656.0	843.8	6.0	10.6
	Yakima	222,581	0	4,296.0	24.7	51.8	0.0
Total		3,361,027	1,384,659	22,165.0	6576.3	151.6	210.6

Upper Willamette O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Benton	78,153	6,401	676.0	99.7	115.6	64.2
	Clackamas	338,391	269,633	1,868.0	666.1	181.2	404.8
	Columbia	43,560	0	657.0	3.1	66.3	0.0
	Lane	322,959	0	4,554.0	0.8	70.9	0.0
	Lincoln	44,479	0	980.0	2.5	45.4	0.0
	Linn	103,069	95,659	2,292.0	1309.5	45.0	73.1
	Marion	284,834	284,277	1,184.0	911.3	240.6	312.0
	Multnomah	660,486	609,074	435.0	188.1	1518.4	3237.5
	Polk	62,380	62,370	741.0	641.6	84.2	97.2
	Tillamook	24,262	0	1,102.0	9.6	22.0	0.0
	Washington	445,342	445,163	724.0	638.2	615.1	697.5
	Yamhill	84,992	84,986	716.0	659.2	118.7	128.9
Total		2,492,907	1,857,563	15,929.0	5129.6	156.5	362.1

Middle Columbia River O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon	Baker	16,741	0	3,068.0	0.3	5.5	0.0
	Clackamas	338,391	0	1,868.0	0.6	181.2	0.0
	Crook	19,182	0	2,979.0	73.0	6.4	0.0
	Gilliam	1,915	1,832	1,204.0	1076.9	1.6	1.7
	Grant	7,935	7,597	4,529.0	3501.0	1.8	2.2
	Hood River	20,411	4,116	522.0	172.6	39.1	23.8

Middle Columbia River O. mykiss ESU							
		Population		Area (sq. miles)		Population Density	
State	County	County	ESU	County	ESU	County	ESU
Oregon, cont.	Jefferson	19,009	3,955	1,781.0	768.6	10.7	5.1
	Morrow	10,995	7,815	2,032.0	714.3	5.4	10.9
	Multnomah	660,486	1,067	435.0	76.9	1518.4	13.9
	Sherman	1,934	1,934	823.0	829.5	2.3	2.3
	Umatilla	70,548	70,122	3,215.0	2795.6	21.9	25.1
	Union	24,530	0	2,037.0	27.8	12.0	0.0
	Wallowa	7,226	0	3,145.0	14.8	2.3	0.0
	Wasco	23,791	23,550	2,381.0	2283.0	10.0	10.3
	Wheeler	1,547	1,546	1,715.0	1626.7	0.9	1.0
Washington	Benton	142,475	142,317	1,703.0	1408.5	83.7	101.0
	Chelan	66,616	0	2,921.0	0.2	22.8	0.0
	Clark	345,238	6,213	628.0	19.7	549.7	314.7
	Columbia	4,064	3,526	869.0	310.1	4.7	11.4
	Franklin	49,347	12,225	1,242.0	73.8	39.7	165.6
	King	1,737,034	0	2,126.0	0.7	817.0	0.0
	Kittitas	33,362	33,188	2,297.0	1928.0	14.5	17.2
	Klickitat	19,161	16,447	1,872.0	1695.5	10.2	9.7
	Lewis	68,600	0	2,408.0	0.8	28.5	0.0
	Skamania	9,872	4,933	1,656.0	153.6	6.0	32.1
	Walla Walla	55,180	52,874	1,271.0	874.5	43.4	60.5
	Yakima	222,581	222,581	4,296.0	4175.9	51.8	53.3
Total		3,978,171	617,838	55,023.0	24602.9	72.3	25.1

Appendix B.2
County and ESU Income and Employment

Puget Sound chinook salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Washington	Chelan	$1,631,818	$0	46,640	0	13.6%
	Clallam	$1,587,944	$1,152,967	31,902	23,163	12.3%
	Island	$1,954,071	$44,566	33,917	774	6.6%
	Jefferson	$722,319	$56,471	13,110	1,025	11.4%
	King	$79,448,105	$78,930,033	1,449,735	1,440,281	8.0%
	Kitsap	$6,161,556	$6,160,679	112,961	112,945	8.9%
	Kittitas	$715,194	$0	17,425	0	13.3%
	Lewis	$1,459,299	$0	34,350	0	14.2%
	Mason	$1,047,656	$985,969	17,694	16,652	12.2%
	Pierce	$18,554,119	$9,262,472	336,568	168,019	11.0%
	San Juan	$529,474	$39,493	9,339	697	8.1%
	Skagit	$2,791,498	$2,777,998	58,895	58,610	11.1%
	Snohomish	$17,888,900	$17,597,080	279,382	274,824	7.2%
	Thurston	$5,714,614	$4,883,803	111,370	95,179	9.0%
	Whatcom	$3,949,744	$3,723,908	93,745	88,385	11.4%
Total		$144,156,311	$125,615,440	2,647,033	2,280,554	

Lower Columbia River chinook salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Clackamas	$11,947,931	$9,965,207	190,661	159,021	6.4%
	Clatsop	$867,994	$563,867	22,356	14,523	13.3%
	Columbia	$1,121,691	$1,022,088	15,562	14,180	8.6%
	Hood River	$449,524	$442,520	13,441	13,232	13.0%
	Marion	$6,848,238	$37,194	161,713	878	13.2%
	Multnomah	$21,888,210	$20,708,740	553,620	523,788	12.2%
	Wasco	$574,677	$17,126	12,804	382	12.9%
	Washington	$14,240,115	$65,966	278,916	1,292	6.7%
	Yamhill	$1,993,160	$8,771	39,146	172	10.5%

Lower Columbia River chinook salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Washington	Clark	$10,066,613	$10,066,613	158,933	158,933	9.0%
	Cowlitz	$2,189,169	$2,185,754	48,554	48,478	12.8%
	Klickitat	$412,280	$147,260	9,206	3,288	15.5%
	Lewis	$1,459,299	$473,996	34,350	11,157	14.2%
	Pacific	$438,818	$22,501	9,591	492	15.6%
	Pierce	$18,554,119	$0	336,568	0	11.0%
	Skamania	$222,358	$222,065	2,904	2,900	10.1%
	Wahkiakum	$84,853	$65,304	1,649	1,269	10.2%
	Yakima	$4,933,539	$0	115,129	0	18.3%
Total		$98,292,588	$46,014,973	2,005,103	953,986	

Upper Willamette River chinook salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Benton	$2,317,184	$2,286,467	51,480	50,798	9.1%
	Clackamas	$11,947,931	$10,718,151	190,661	171,037	6.4%
	Douglas	$2,253,300	$0	53,100	0	14.6%
	Lane	$8,291,667	$7,857,930	188,707	178,836	13.3%
	Lincoln	$1,060,310	$2,002	25,194	48	14.7%
	Linn	$2,292,654	$2,289,829	52,999	52,934	12.3%
	Marion	$6,848,238	$6,834,990	161,713	161,400	13.2%
	Multnomah	$21,888,210	$19,083,577	553,620	482,682	12.2%
	Polk	$1,539,471	$1,461,066	23,617	22,414	10.5%
	Washington	$14,240,115	$65,166	278,916	1,276	6.7%
	Yamhill	$1,993,160	$1,892,648	39,146	37,172	10.5%
Total		$74,672,240	$52,491,827	1,619,153	1,158,596	

Upper Columbia River spring-run chinook salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Gilliam	$29,770	$8,970	1,366	412	9.4%
	Hood River	$449,524	$83,668	13,441	2,502	13.0%
	Morrow	$208,918	$146,309	5,233	3,665	7.0%
	Multnomah	$21,888,210	$35,360	553,620	894	12.2%
	Sherman	$26,540	$12,474	1,263	594	12.0%
	Umatilla	$1,533,626	$145,302	38,835	3,679	15.6%
	Wasco	$574,677	$449,529	12,804	10,016	12.9%
Washington	Adams	$336,338	$1,822	9,051	49	15.4%
	Benton	$3,710,994	$2,339,248	77,688	48,971	9.3%
	Chelan	$1,631,818	$1,428,478	46,640	40,828	13.6%
	Clark	$10,066,613	$181,162	158,933	2,860	9.0%
	Douglas	$706,684	$593,993	11,183	9,400	10.0%
	Franklin	$927,912	$242,062	25,914	6,760	17.7%
	Grant	$1,478,340	$137,705	38,277	3,565	14.9%
	Kittitas	$715,194	$3,730	17,425	91	13.3%
	Klickitat	$412,280	$144,807	9,206	3,233	15.5%
	Okanogan	$797,208	$190,134	22,573	5,384	18.5%
	Skamania	$222,358	$111,111	2,904	1,451	10.1%
	Walla Walla	$1,249,519	$65,691	31,530	1,658	14.5%
	Yakima	$4,933,539	$66	115,129	2	18.3%
Total		$51,900,062	$6,321,621	1,193,015	146,013	

Oregon Coast coho salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Benton	$2,317,184	$30,717	51,480	682	9.1%
	Clatsop	$867,994	$302,446	22,356	7,790	13.3%
	Columbia	$1,121,691	$100,993	15,562	1,401	8.6%
	Coos	$1,391,499	$1,391,499	31,055	31,055	16.7%
	Curry	$509,965	$20,628	10,456	423	13.9%
	Douglas	$2,253,300	$2,244,390	53,100	52,890	14.6%
	Jackson	$4,573,886	$0	103,632	0	13.8%

Oregon Coast coho salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon, cont.	Josephine	$1,616,191	$0	34,371	0	18.7%
	Lane	$8,291,667	$433,737	188,707	9,871	13.3%
	Lincoln	$1,060,310	$1,056,567	25,194	25,105	14.7%
	Polk	$1,539,471	$247	23,617	4	10.5%
	Tillamook	$548,318	$548,318	12,409	12,409	13.6%
	Washington	$14,240,115	$6,171	278,916	121	6.7%
	Yamhill	$1,993,160	$0	39,146	0	10.5%
Total		$42,324,751	$6,135,714	890,001	141,751	

Hood Canal summer-run chum salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Washington	Clallam	$1,587,944	$510,800	31,902	10,262	12.3%
	Jefferson	$722,319	$705,397	13,110	12,803	11.4%
	Kitsap	$6,161,556	$592,359	112,961	10,860	8.9%
	Mason	$1,047,656	$233,748	17,694	3,948	12.2%
Total		$9,519,475	$2,042,304	175,667	37,873	

Columbia River chum salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Clatsop	$867,994	$247,170	22,356	6,366	13.3%
	Hood River	$449,524	$83,668	13,441	2,502	13.0%
	Multnomah	$21,888,210	$35,360	553,620	894	12.2%
	Wasco	$574,677	$17,126	12,804	382	12.9%
Washington	Clark	$10,066,613	$10,066,613	158,933	158,933	9.0%
	Cowlitz	$2,189,169	$2,185,754	48,554	48,478	12.8%

Columbia River chum salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Washington, cont.	Klickitat	$412,280	$147,260	9,206	3,288	15.5%
	Lewis	$1,459,299	$268,715	34,350	6,325	14.2%
	Pacific	$438,818	$22,501	9,591	492	15.6%
	Skamania	$222,358	$159,133	2,904	2,078	10.1%
	Wahkiakum	$84,853	$65,304	1,649	1,269	10.2%
	Yakima	$4,933,539	$0	115,129	0	18.3%
Total		$43,587,334	$13,298,604	982,537	231,008	

Ozette Lake sockeye salmon ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Washington	Clallam	$1,587,944	$2,092	31,902	42	12.3%
Total		$1,587,944	$2,092	31,902	42	

Upper Columbia River O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Gilliam	$29,770	$8,970	1,366	412	9.4%
	Hood River	$449,524	$83,668	13,441	2,502	13.0%
	Morrow	$208,918	$146,309	5,233	3,665	7.0%
	Multnomah	$21,888,210	$35,360	553,620	894	12.2%
	Sherman	$26,540	$12,474	1,263	594	12.0%
	Umatilla	$1,533,626	$145,302	38,835	3,679	15.6%
	Wasco	$574,677	$449,529	12,804	10,016	12.9%
Washington	Adams	$336,338	$73,336	9,051	1,974	15.4%
	Benton	$3,710,994	$2,339,248	77,688	48,971	9.3%
	Chelan	$1,631,818	$1,629,270	46,640	46,567	13.6%

Upper Columbia River O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Washington, cont.	Clark	$10,066,613	$181,162	158,933	2,860	9.0%
	Douglas	$706,684	$661,903	11,183	10,474	10.0%
	Franklin	$927,912	$242,062	25,914	6,760	17.7%
	Grant	$1,478,340	$225,814	38,277	5,847	14.9%
	Kittitas	$715,194	$3,730	17,425	91	13.3%
	Klickitat	$412,280	$144,807	9,206	3,233	15.5%
	Okanogan	$797,208	$709,113	22,573	20,079	18.5%
	Skamania	$222,358	$111,111	2,904	1,451	10.1%
	Walla Walla	$1,249,519	$65,691	31,530	1,658	14.5%
	Yakima	$4,933,539	$66	115,129	2	18.3%
Total		$51,900,062	$7,268,925	1,193,015	171,728	

Snake River Basin O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Idaho	Adams	$75,009	$4,294	2,128	122	14.6%
	Blaine	$808,720	$979	17,556	21	7.5%
	Boise	$129,455	$0	2,241	0	11.3%
	Clearwater	$178,986	$173,514	4,718	4,574	14.9%
	Custer	$98,230	$61,196	2,647	1,649	12.1%
	Idaho	$289,550	$288,430	8,161	8,129	17.6%
	Latah	$739,608	$108,374	20,482	3,001	13.5%
	Lemhi	$152,688	$150,204	4,330	4,260	15.8%
	Lewis	$81,019	$58,661	2,046	1,481	15.2%
	Nez Perce	$944,025	$925,074	27,112	26,568	12.8%
	Valley	$210,048	$2,059	5,580	55	13.8%
Oregon	Baker	$336,679	$0	9,037	0	16.8%
	Gilliam	$29,770	$8,970	1,366	412	9.4%
	Grant	$167,646	$0	4,436	0	14.5%
	Hood River	$449,524	$83,668	13,441	2,502	13.0%
	Morrow	$208,918	$146,309	5,233	3,665	7.0%

Snake River Basin O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon, cont.	Multnomah	$21,888,210	$35,360	553,620	894	12.2%
	Sherman	$26,540	$12,474	1,263	594	12.0%
	Umatilla	$1,533,626	$145,519	38,835	3,685	15.6%
	Union	$560,583	$542,415	15,304	14,808	13.9%
	Wallowa	$156,473	$156,473	4,543	4,543	13.1%
	Wasco	$574,677	$449,529	12,804	10,016	12.9%
Washington	Adams	$336,338	$696	9,051	19	15.4%
	Asotin	$493,959	$493,959	7,605	7,605	15.6%
	Benton	$3,710,994	$2,339,248	77,688	48,971	9.3%
	Clark	$10,066,613	$181,162	158,933	2,860	9.0%
	Columbia	$97,988	$8,391	2,483	213	12.5%
	Franklin	$927,912	$246,123	25,914	6,874	17.7%
	Garfield	$52,489	$52,489	1,389	1,389	10.9%
	Klickitat	$412,280	$144,807	9,206	3,233	15.5%
	Skamania	$222,358	$111,111	2,904	1,451	10.1%
	Walla Walla	$1,249,519	$112,294	31,530	2,834	14.5%
	Whitman	$826,933	$24,175	22,070	645	14.5%
	Yakima	$4,933,539	$66	115,129	2	18.3%
Total		$52,970,906	$7,068,023	1,220,785	167,073	

Lower Columbia River O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Clackamas	$11,947,931	$9,978,306	190,661	159,230	6.4%
	Columbia	$1,121,691	$560,459	15,562	7,776	8.6%
	Hood River	$449,524	$442,520	13,441	13,232	13.0%
	Marion	$6,848,238	$37,339	161,713	882	13.2%
	Multnomah	$21,888,210	$20,708,740	553,620	523,788	12.2%
	Wasco	$574,677	$17,126	12,804	382	12.9%

Lower Columbia River O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon, cont.	Washington	$14,240,115	$65,966	278,916	1,292	6.7%
	Yamhill	$1,993,160	$8,771	39,146	172	10.5%
Washington	Clark	$10,066,613	$10,066,613	158,933	158,933	9.0%
	Cowlitz	$2,189,169	$1,177,584	48,554	26,118	12.8%
	Klickitat	$412,280	$88,864	9,206	1,984	15.5%
	Lewis	$1,459,299	$473,996	34,350	11,157	14.2%
	Pierce	$18,554,119	$0	336,568	0	11.0%
	Skamania	$222,358	$201,636	2,904	2,633	10.1%
	Yakima	$4,933,539	$0	115,129	0	18.3%
Total		$96,900,923	$43,827,919	1,971,507	907,579	

Upper Willamette O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Benton	$2,317,184	$189,785	51,480	4,216	9.1%
	Clackamas	$11,947,931	$9,520,219	190,661	151,920	6.4%
	Columbia	$1,121,691	$0	15,562	0	8.6%
	Lane	$8,291,667	$0	188,707	0	13.3%
	Lincoln	$1,060,310	$0	25,194	0	14.7%
	Linn	$2,292,654	$2,127,827	52,999	49,189	12.3%
	Marion	$6,848,238	$6,834,846	161,713	161,397	13.2%
	Multnomah	$21,888,210	$20,184,439	553,620	510,526	12.2%
	Polk	$1,539,471	$1,539,224	23,617	23,613	10.5%
	Tillamook	$548,318	$0	12,409	0	13.6%
	Washington	$14,240,115	$14,234,391	278,916	278,804	6.7%
	Yamhill	$1,993,160	$1,993,019	39,146	39,143	10.5%
Total		$74,088,949	$56,623,752	1,594,024	1,218,809	

Middle Columbia River O. mykiss ESU						
		Personal Income ($1000)		Total Employment		Living Below Poverty Level (% of County)
State	County	County	ESU	County	ESU	
Oregon	Baker	$336,679	$0	9,037	0	16.8%
	Clackamas	$11,947,931	$0	190,661	0	6.4%
	Crook	$391,923	$0	9,420	0	12.8%
	Gilliam	$29,770	$28,480	1,366	1,307	9.4%
	Grant	$167,646	$160,505	4,436	4,247	14.5%
	Hood River	$449,524	$90,649	13,441	2,710	13.0%
	Jefferson	$343,623	$71,494	8,708	1,812	16.6%
	Morrow	$208,918	$148,494	5,233	3,719	7.0%
	Multnomah	$21,888,210	$35,360	553,620	894	12.2%
	Sherman	$26,540	$26,540	1,263	1,263	12.0%
	Umatilla	$1,533,626	$1,524,365	38,835	38,600	15.6%
	Union	$560,583	$0	15,304	0	13.9%
	Wallowa	$156,473	$0	4,543	0	13.1%
	Wasco	$574,677	$568,856	12,804	12,674	12.9%
	Wheeler	$27,741	$27,723	757	757	12.5%
Washington	Benton	$3,710,994	$3,706,879	77,688	77,602	9.3%
	Chelan	$1,631,818	$0	46,640	0	13.6%
	Clark	$10,066,613	$181,162	158,933	2,860	9.0%
	Columbia	$97,988	$85,016	2,483	2,154	12.5%
	Franklin	$927,912	$229,877	25,914	6,420	17.7%
	King	$79,448,105	$0	1,449,735	0	8.0%
	Kittitas	$715,194	$711,464	17,425	17,334	13.3%
	Klickitat	$412,280	$353,884	9,206	7,902	15.5%
	Lewis	$1,459,299	$0	34,350	0	14.2%
	Skamania	$222,358	$111,111	2,904	1,451	10.1%
	Walla Walla	$1,249,519	$1,197,301	31,530	30,212	14.5%
	Yakima	$4,933,539	$4,933,539	115,129	115,129	18.3%
Total		$143,519,483	$14,192,698	2,841,365	329,049	

Appendix B-3
County Land Ownership

Puget Sound chinook salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Washington	Chelan	99.80%	0.20%	0.00%	0.00%	0.00%
	Clallam	65.02%	25.22%	8.37%	0.14%	1.25%
	Island	14.25%	80.56%	5.15%	0.00%	0.04%
	Jefferson	92.41%	5.33%	1.41%	0.00%	0.86%
	King	23.34%	63.50%	12.83%	0.30%	0.02%
	Kitsap	3.48%	83.33%	9.93%	3.22%	0.04%
	Kittitas	48.59%	48.39%	3.02%	0.00%	0.00%
	Lewis	2.91%	97.09%	0.00%	0.00%	0.00%
	Mason	29.37%	56.72%	12.60%	1.23%	0.09%
	Pierce	34.02%	60.57%	2.88%	2.52%	0.01%
	San Juan	3.04%	91.94%	4.94%	0.00%	0.08%
	Skagit	41.94%	44.11%	13.23%	0.71%	0.01%
	Snohomish	48.10%	39.69%	11.60%	0.60%	0.01%
	Thurston	7.45%	85.12%	6.73%	0.70%	0.01%
	Whatcom	48.72%	38.87%	10.26%	1.59%	0.02%
Total		39.50%	49.31%	10.00%	1.00%	0.12%

Lower Columbia River chinook salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Clackamas	40.82%	59.07%	0.03%	0.00%	0.00%
	Clatsop	0.29%	77.31%	20.16%	0.00%	2.24%
	Columbia	2.08%	93.01%	3.91%	0.00%	1.00%
	Hood River	59.91%	38.16%	1.75%	0.05%	0.03%
	Marion	0.00%	100.00%	0.00%	0.00%	0.00%
	Multnomah	30.25%	64.68%	2.81%	0.00%	2.25%
	Wasco	16.66%	78.05%	5.29%	0.00%	0.00%
	Washington	17.58%	82.11%	0.31%	0.00%	0.00%
	Yamhill	0.00%	100.00%	0.00%	0.00%	0.00%
Washington	Clark	2.01%	85.15%	12.83%	0.00%	0.02%
	Cowlitz	4.07%	85.79%	10.14%	0.00%	0.00%
	Klickitat	7.40%	63.47%	28.75%	0.12%	0.27%

Lower Columbia River chinook salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Washington, cont.	Lewis	46.96%	49.20%	3.84%	0.00%	0.00%
	Pacific	0.00%	89.60%	10.40%	0.00%	0.00%
	Pierce	100.00%	0.00%	0.00%	0.00%	0.00%
	Skamania	75.58%	15.85%	8.55%	0.00%	0.01%
	Wahkiakum	1.38%	74.56%	24.05%	0.00%	0.00%
	Yakima	98.52%	0.01%	0.95%	0.36%	0.16%
Total		32.81%	58.86%	8.00%	0.01%	0.30%

Upper Willamette River chinook salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unassigned
Oregon	Benton	6.11%	86.91%	6.98%	0.00%	0.00%
	Clackamas	43.42%	54.99%	0.01%	1.44%	0.00%
	Douglas	100.00%	0.00%	0.00%	0.00%	0.00%
	Lane	87.79%	12.21%	0.00%	0.00%	0.00%
	Lincoln	33.89%	0.00%	0.00%	66.11%	0.00%
	Linn	100.00%	0.00%	0.00%	0.00%	0.00%
	Marion	55.64%	44.23%	0.06%	0.00%	0.00%
	Multnomah	0.19%	75.47%	24.35%	0.00%	0.00%
	Polk	25.75%	74.21%	0.05%	0.00%	0.00%
	Washington	18.35%	79.33%	1.78%	0.52%	0.01%
	Yamhill	0.00%	99.47%	0.00%	0.00%	0.53%
Total		4.68%	94.65%	0.63%	0.04%	0.00%

Upper Columbia River spring-run chinook salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Gilliam	2.33%	97.52%	0.00%	0.15%	0.00%
	Hood River	75.51%	19.05%	5.15%	0.20%	0.09%
	Morrow	26.05%	73.95%	0.00%	0.00%	0.00%
	Multnomah	65.86%	15.43%	9.17%	0.00%	9.54%
	Sherman	0.23%	99.77%	0.00%	0.00%	0.00%
	Umatilla	8.24%	91.64%	0.08%	0.00%	0.04%
	Wasco	11.71%	85.14%	2.43%	0.64%	0.08%

Upper Columbia River spring-run chinook salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Washington	Adams	71.14%	28.86%	0.00%	0.00%	0.00%
	Benton	45.28%	52.36%	2.36%	0.00%	0.00%
	Chelan	72.98%	22.32%	4.70%	0.00%	0.00%
	Clark	8.65%	85.59%	5.24%	0.00%	0.52%
	Douglas	5.62%	89.79%	4.53%	0.06%	0.00%
	Franklin	56.15%	42.10%	1.74%	0.00%	0.00%
	Grant	49.72%	44.01%	6.27%	0.00%	0.00%
	Kittitas	22.84%	24.31%	52.85%	0.00%	0.00%
	Klickitat	4.15%	88.79%	5.65%	0.00%	1.41%
	Okanogan	80.17%	14.45%	5.30%	0.07%	0.00%
	Skamania	21.43%	49.92%	28.57%	0.00%	0.08%
	Walla Walla	2.16%	91.06%	6.79%	0.00%	0.00%
	Yakima	80.74%	18.85%	0.40%	0.00%	0.00%
Total		53.42%	39.04%	7.33%	0.04%	0.16%

Oregon Coast coho salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Benton	50.92%	47.80%	1.28%	0.00%	0.00%
	Clatsop	0.30%	62.33%	36.13%	0.00%	1.24%
	Columbia	2.83%	94.64%	2.53%	0.00%	0.00%
	Coos	23.29%	70.10%	5.35%	0.65%	0.61%
	Curry	20.30%	78.27%	1.33%	0.01%	0.09%
	Douglas	44.01%	54.11%	1.47%	0.02%	0.39%
	Jackson	38.85%	61.15%	0.00%	0.00%	0.00%
	Josephine	90.06%	5.34%	4.59%	0.00%	0.00%
	Lane	60.80%	38.08%	0.46%	0.01%	0.65%
	Lincoln	30.90%	63.57%	3.39%	0.51%	1.57%
	Polk	6.34%	67.64%	26.02%	0.00%	0.00%
	Tillamook	19.03%	35.74%	44.05%	0.00%	1.19%
	Washington	2.42%	49.21%	48.37%	0.00%	0.00%
	Yamhill	67.71%	31.76%	0.50%	0.03%	0.00%
Total		35.17%	55.42%	8.59%	0.16%	0.65%

Hood Canal summer-run chum salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Washington	Clallam	58.18%	29.85%	10.37%	0.05%	1.56%
	Jefferson	56.21%	34.90%	6.41%	0.00%	2.48%
	Kitsap	6.05%	74.24%	18.14%	1.50%	0.07%
	Mason	45.61%	34.23%	18.31%	1.75%	0.10%
Total		49.02%	37.08%	11.84%	0.69%	1.36%

Columbia River chum salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Clatsop	0.00%	72.26%	25.35%	0.00%	2.39%
	Hood River	72.94%	21.05%	5.69%	0.22%	0.10%
	Multnomah	65.70%	15.60%	9.14%	0.00%	9.56%
	Wasco	15.01%	79.59%	5.40%	0.00%	0.00%
Washington	Clark	2.01%	85.15%	12.83%	0.00%	0.02%
	Cowlitz	4.07%	85.79%	10.14%	0.00%	0.00%
	Klickitat	4.63%	65.61%	29.36%	0.12%	0.28%
	Lewis	1.35%	92.45%	6.21%	0.00%	0.00%
	Pacific	0.00%	89.60%	10.40%	0.00%	0.00%
	Skamania	61.00%	24.04%	14.94%	0.00%	0.02%
	Wahkiakum	1.38%	74.56%	24.05%	0.00%	0.00%
	Yakima	98.01%	0.01%	1.56%	0.26%	0.16%
Total		16.55%	69.54%	13.58%	0.02%	0.31%

Ozette Lake sockeye salmon ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Washington	Clallam	18.91%	71.82%	7.04%	1.18%	1.05%
Total		18.91%	71.82%	7.04%	1.18%	1.05%

Upper Columbia River O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Gilliam	2.33%	97.52%	0.00%	0.15%	0.00%
	Hood River	75.51%	19.05%	5.15%	0.20%	0.09%
	Morrow	26.05%	73.95%	0.00%	0.00%	0.00%
	Multnomah	65.86%	15.43%	9.17%	0.00%	9.54%
	Sherman	0.23%	99.77%	0.00%	0.00%	0.00%
	Umatilla	8.24%	91.64%	0.08%	0.00%	0.04%
	Wasco	11.71%	85.14%	2.43%	0.64%	0.08%
Washington	Adams	36.16%	60.99%	2.84%	0.00%	0.00%
	Benton	45.28%	52.36%	2.36%	0.00%	0.00%
	Chelan	71.77%	23.84%	4.38%	0.00%	0.01%
	Clark	8.65%	85.59%	5.24%	0.00%	0.52%
	Douglas	4.36%	82.83%	12.73%	0.06%	0.03%
	Franklin	56.15%	42.10%	1.74%	0.00%	0.00%
	Grant	42.24%	48.35%	9.41%	0.00%	0.00%
	Kittitas	22.84%	24.31%	52.85%	0.00%	0.00%
	Klickitat	4.15%	88.79%	5.65%	0.00%	1.41%
	Okanogan	48.62%	27.79%	8.49%	15.00%	0.11%
	Skamania	21.43%	49.92%	28.57%	0.00%	0.08%
	Walla Walla	2.16%	91.06%	6.79%	0.00%	0.00%
	Yakima	80.74%	18.85%	0.40%	0.00%	0.00%
Total		43.65%	42.26%	8.69%	5.24%	0.16%

Snake River Basin O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Idaho	Adams	85.70%	12.27%	1.65%	0.00%	0.00%
	Blaine	91.31%	6.77%	0.37%	0.00%	0.00%
	Boise	100.00%	0.00%	0.00%	0.00%	0.00%
	Clearwater	16.48%	46.66%	19.90%	15.67%	0.01%
	Custer	94.55%	3.94%	1.25%	0.00%	0.00%
	Idaho	83.07%	11.98%	1.47%	3.36%	0.01%
	Latah	16.50%	77.24%	6.23%	0.00%	0.00%
	Lemhi	90.64%	8.05%	1.19%	0.00%	0.02%
	Lewis	0.69%	15.13%	0.33%	83.66%	0.00%
	Nez Perce	3.15%	45.02%	5.18%	46.09%	0.01%
	Valley	98.48%	0.59%	0.85%	0.00%	0.00%

Snake River Basin O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Baker	100.00%	0.00%	0.00%	0.00%	0.00%
	Gilliam	2.33%	97.52%	0.00%	0.15%	0.00%
	Grant	100.00%	0.00%	0.00%	0.00%	0.00%
	Hood River	75.51%	19.05%	5.15%	0.20%	0.09%
	Morrow	26.05%	73.95%	0.00%	0.00%	0.00%
	Multnomah	65.86%	15.43%	9.17%	0.00%	9.54%
	Sherman	0.23%	99.77%	0.00%	0.00%	0.00%
	Umatilla	27.23%	71.08%	0.12%	1.44%	0.13%
	Union	48.58%	51.11%	0.16%	0.13%	0.01%
	Wallowa	56.38%	43.48%	0.15%	0.00%	0.00%
	Wasco	11.71%	85.14%	2.43%	0.64%	0.08%
Washington		0.23%	90.92%	8.86%	0.00%	0.00%
		16.09%	76.31%	7.60%	0.00%	0.00%
		23.28%	73.54%	3.18%	0.00%	0.00%
		8.65%	85.59%	5.24%	0.00%	0.52%
		38.71%	56.41%	4.87%	0.00%	0.00%
		16.77%	76.73%	6.49%	0.00%	0.00%
		20.82%	76.16%	3.03%	0.00%	0.00%
		4.15%	88.79%	5.65%	0.00%	1.41%
		21.43%	49.92%	28.57%	0.00%	0.08%
		0.98%	94.31%	4.70%	0.00%	0.00%
		0.31%	95.45%	4.17%	0.00%	0.07%
		0.00%	96.51%	3.49%	0.00%	0.00%
Total		64.77%	29.27%	2.32%	3.45%	0.05%

Lower Columbia River O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Clackamas	62.53%	35.70%	0.02%	1.56%	0.00%
	Columbia	5.30%	84.22%	8.99%	0.00%	1.48%
	Hood River	59.91%	38.16%	1.75%	0.05%	0.03%
	Marion	85.45%	9.58%	0.00%	4.91%	0.06%
	Multnomah	30.25%	64.68%	2.81%	0.00%	2.25%
	Wasco	19.48%	73.88%	5.01%	1.63%	0.00%
	Washington	17.58%	82.11%	0.31%	0.00%	0.00%
	Yamhill	0.00%	100.00%	0.00%	0.00%	0.00%

Lower Columbia River O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Washington	Clark	2.01%	85.15%	12.83%	0.00%	0.02%
	Cowlitz	4.57%	85.05%	10.38%	0.00%	0.00%
	Klickitat	9.16%	78.11%	11.56%	0.00%	1.18%
	Lewis	47.14%	49.00%	3.86%	0.00%	0.00%
	Pierce	100.00%	0.00%	0.00%	0.00%	0.00%
	Skamania	71.95%	17.33%	10.70%	0.00%	0.02%
	Yakima	99.32%	0.00%	0.00%	0.52%	0.16%
Total		35.49%	56.15%	8.32%	0.00%	0.03%

Upper Willamette O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Benton	1.23%	80.82%	17.95%	0.00%	0.00%
	Clackamas	10.66%	89.33%	0.01%	0.00%	0.00%
	Columbia	42.46%	57.42%	0.12%	0.00%	0.00%
	Lane	8.20%	91.80%	0.00%	0.00%	0.00%
	Lincoln	0.00%	100.00%	0.00%	0.00%	0.00%
	Linn	14.93%	85.06%	0.01%	0.00%	0.00%
	Marion	10.25%	87.78%	1.97%	0.00%	0.00%
	Multnomah	0.18%	99.37%	0.00%	0.00%	0.46%
	Polk	7.57%	91.62%	0.58%	0.23%	0.00%
	Tillamook	71.88%	17.15%	10.97%	0.00%	0.00%
	Washington	2.33%	91.73%	5.94%	0.00%	0.00%
	Yamhill	7.45%	89.80%	0.35%	2.40%	0.00%
Total		9.40%	88.66%	1.58%	0.34%	0.02%

Middle Columbia River O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon	Baker	95.07%	4.93%	0.00%	0.00%	0.00%
	Clackamas	64.93%	0.00%	0.00%	34.98%	0.09%
	Crook	81.57%	18.43%	0.00%	0.00%	0.00%
	Gilliam	7.12%	92.09%	0.22%	0.56%	0.00%
	Grant	56.24%	43.58%	0.18%	0.00%	0.00%

Middle Columbia River O. mykiss ESU						
		Land Owner (% of ESU-portion of County)				
State	County	Federal	Private/ Other	State	Tribal	Unas-signed
Oregon, cont.	Hood River	73.70%	22.36%	3.74%	0.14%	0.06%
	Jefferson	9.56%	62.97%	0.02%	27.45%	0.00%
	Morrow	35.87%	64.12%	0.01%	0.00%	0.00%
	Multnomah	65.86%	15.43%	9.17%	0.00%	9.54%
	Sherman	10.20%	89.64%	0.10%	0.06%	0.00%
	Umatilla	22.09%	68.33%	0.04%	9.49%	0.05%
	Union	88.18%	8.65%	2.68%	0.48%	0.02%
	Wallowa	99.20%	0.80%	0.00%	0.00%	0.00%
	Wasco	14.03%	60.04%	0.29%	25.59%	0.01%
	Wheeler	24.90%	74.73%	0.37%	0.00%	0.00%
Washington	Benton	22.30%	73.41%	4.29%	0.00%	0.00%
	Chelan	92.56%	4.39%	3.05%	0.00%	0.00%
	Clark	8.65%	85.59%	5.24%	0.00%	0.52%
	Columbia	21.45%	76.12%	2.43%	0.00%	0.00%
	Franklin	33.62%	64.64%	1.75%	0.00%	0.00%
	King	71.85%	28.10%	0.06%	0.00%	0.00%
	Kittitas	38.14%	49.66%	12.19%	0.00%	0.00%
	Klickitat	2.05%	78.51%	6.62%	12.49%	0.33%
	Lewis	31.62%	0.00%	0.00%	66.92%	1.47%
	Skamania	21.43%	49.92%	28.57%	0.00%	0.08%
	Walla Walla	0.95%	95.95%	3.10%	0.00%	0.00%
	Yakima	22.83%	23.67%	7.06%	46.37%	0.06%
Total		25.43%	58.09%	3.34%	13.07%	0.07%

Appendix C.1
Watershed Demographics (estimated)

Puget Sound chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1711000201	85,367	125.9	678.2	30.5%
1711000202	37,833	204.2	185.3	29.6%
1711000204	15,712	84.9	185.0	30.5%
1711000401	143	193.2	0.7	30.5%
1711000402	138	99.4	1.4	30.5%
1711000403	1,136	185.4	6.1	30.5%
1711000404	5,124	128.8	39.8	30.5%
1711000405	47,146	171.4	275.0	30.5%
1711000504	0	241.3	0.0	N/A
1711000505	329	134.6	2.4	29.6%
1711000506	142	185.0	0.8	29.5%
1711000507	861	140.1	6.1	29.5%
1711000508	126	298.0	0.4	29.5%
1711000601	9	239.0	0.0	30.2%
1711000602	0	152.3	0.0	N/A
1711000603	6	159.3	0.0	29.5%
1711000604	2,074	150.8	13.8	30.1%
1711000701	14,360	280.5	51.2	29.5%
1711000702	49,801	173.8	286.5	29.5%
1711000801	3,817	286.6	13.3	30.2%
1711000802	9,721	254.8	38.2	30.2%
1711000803	27,248	160.0	170.3	30.2%
1711000901	85	241.2	0.4	15.2%
1711000902	1,075	266.5	4.0	22.5%
1711000903	8,206	115.8	70.8	30.2%
1711000904	2,385	104.9	22.7	30.2%
1711000905	23,456	109.9	213.4	30.2%
1711001003	18,052	312.3	57.8	15.2%
1711001004	20,411	191.4	106.6	17.4%
1711001101	44,174	141.3	312.7	30.2%
1711001102	177,654	156.6	1134.6	30.2%
1711001201	55,999	178.5	313.7	15.2%
1711001202	101,968	100.7	1012.3	15.2%
1711001203	642,239	165.3	3884.5	15.2%
1711001204	366,923	156.3	2347.9	24.0%
1711001301	0	135.1	0.0	N/A

Puget Sound chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1711001302	2,128	130.8	16.3	15.2%
1711001303	369,954	231.9	1595.1	15.2%
1711001401	356	291.7	1.2	19.4%
1711001402	59,138	204.0	289.8	17.4%
1711001403	16,357	230.9	70.9	19.6%
1711001404	10,959	185.6	59.1	19.6%
1711001405	268,988	125.1	2149.7	18.5%
1711001502	8,125	194.8	41.7	21.3%
1711001503	56,902	276.5	205.8	23.4%
1711001601	2,579	92.5	27.9	28.6%
1711001602	63,790	83.9	760.6	28.6%
1711001701	2,320	236.1	9.8	28.9%
1711001802	1,232	75.5	16.3	28.7%
1711001803	35	84.0	0.4	28.9%
1711001804	325	78.6	4.1	27.2%
1711001805	266	116.3	2.3	27.2%
1711001806	505	69.8	7.2	27.2%
1711001808	28,231	227.1	124.3	23.8%
1711001900	40,021	305.6	131.0	28.9%
1711001901	233,003	338.0	689.3	21.8%
1711001902	78,776	86.8	907.8	28.6%
1711001904	360,714	134.0	2692.6	18.7%
1711002003	15,477	214.9	72.0	14.8%
1711002004	29,741	156.0	190.6	14.8%
1711002007	1,330	321.4	4.1	14.8%
N01	975	5.7	170.0	30.5%
N02	1,050	12.0	87.6	40.3%
N03	1,608	13.1	122.9	29.5%
N04	48	3.3	14.5	30.2%
N05	1,632	11.2	145.7	18.9%
N06	530	4.8	111.1	30.2%
N07	1,331	2.0	673.4	16.5%
N08	2,208	2.5	867.1	15.2%
N09	534	2.0	267.0	19.6%
N10	103	1.5	69.1	28.3%
N11	370	1.6	228.7	19.6%
N12	522	3.1	171.0	28.6%
N13	840	7.0	120.6	28.8%
N14	9,199	25.8	356.6	21.2%

Puget Sound chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
N15	1,105	6.8	162.3	26.0%
N16	184	0.9	216.3	28.9%
N17	409	2.6	156.8	28.7%
N18	828	11.0	75.3	25.9%
N19	215	2.5	87.4	14.8%

Lower Columbia River chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1707010506	2,862	157.8	18.1	20.8%
1707010507	162	102.3	1.6	20.8%
1707010508	13,270	80.2	165.5	20.8%
1707010509	3,101	392.4	7.9	15.8%
1707010510	520	135.7	3.8	19.1%
1707010511	2,274	224.6	10.1	19.1%
1707010512	8,372	144.9	57.8	17.0%
1707010513	3,482	132.1	26.4	19.6%
1708000101	1,345	114.8	11.7	21.4%
1708000102	741	59.0	12.6	21.4%
1708000103	381	53.4	7.1	21.4%
1708000104	7,209	64.0	112.6	21.4%
1708000105	260	139.1	1.9	21.4%
1708000106	37,254	212.9	175.0	43.8%
1708000107	8,997	162.5	55.4	36.3%
1708000108	46,245	73.7	627.3	13.2%
1708000109	274,408	195.3	1405.2	45.0%
1708000205	23,308	234.4	99.4	45.0%
1708000206	11,623	221.6	52.4	29.1%
1708000301	6,771	232.1	29.2	13.2%
1708000302	14,887	152.4	97.7	16.0%
1708000303	2,604	96.1	27.1	16.0%
1708000304	42,971	147.6	291.1	13.2%
1708000305	2,033	158.3	12.8	14.9%
1708000306	1,207	49.2	24.5	10.3%
1708000401	126	216.0	0.6	15.6%
1708000402	1,233	167.2	7.4	15.6%

Lower Columbia River chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1708000403	1,934	207.0	9.3	15.6%
1708000404	0	242.6	0.0	N/A
1708000405	92	193.1	0.5	15.6%
1708000501	2,347	161.3	14.6	15.6%
1708000502	3,918	201.9	19.4	15.6%
1708000503	6,386	208.5	30.6	15.6%
1708000504	3	147.1	0.0	13.2%
1708000505	2	131.6	0.0	13.2%
1708000506	226	125.8	1.8	13.2%
1708000507	12,965	274.3	47.3	14.4%
1708000508	30,454	210.4	144.8	13.2%
1708000601	12,229	209.5	58.4	7.0%
1708000602	10,146	116.4	87.2	7.0%
1708000603	1,820	184.2	9.9	12.7%
1709000704	81,746	135.6	602.8	22.0%
1709001105	5,107	90.1	56.7	21.4%
1709001106	52,639	184.0	286.1	21.4%
1709001201	292,787	94.0	3113.9	16.9%
1709001202	24,322	192.5	126.3	15.7%
1709001203	419,031	121.9	3438.1	13.1%

Upper Willamette River chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1709000101	0	177.0	0.0	N/A
1709000102	2	60.1	0.0	14.2%
1709000103	52	113.1	0.5	14.2%
1709000104	1,107	128.9	8.6	14.2%
1709000105	2,339	171.9	13.6	14.2%
1709000106	720	248.0	2.9	14.2%
1709000107	3,294	159.4	20.7	14.2%
1709000108	374	58.6	6.4	14.2%
1709000109	882	193.2	4.6	14.2%
1709000110	11,059	56.3	196.4	14.2%
1709000201	2,610	279.6	9.3	14.2%
1709000202	690	95.3	7.2	14.2%

Upper Willamette River chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1709000203	11,935	152.3	78.4	14.2%
1709000205	13,539	139.3	97.2	14.2%
1709000301	112,434	411.2	273.5	14.1%
1709000302	163,929	392.5	417.6	13.2%
1709000303	5,773	287.1	20.1	13.0%
1709000304	57,292	163.2	351.1	12.8%
1709000305	28,459	302.7	94.0	10.4%
1709000306	5,872	315.2	18.6	20.9%
1709000401	262	360.6	0.7	14.2%
1709000402	217	159.2	1.4	14.2%
1709000403	0	215.1	0.0	N/A
1709000404	159	92.3	1.7	14.2%
1709000405	605	74.6	8.1	14.2%
1709000406	3,097	179.1	17.3	14.2%
1709000407	26,383	257.9	102.3	14.2%
1709000504	3,632	88.6	41.0	16.4%
1709000505	636	113.2	5.6	24.7%
1709000506	13,386	113.0	118.5	22.4%
1709000601	24,115	184.8	130.5	13.0%
1709000602	3,416	156.4	21.8	13.0%
1709000603	3,141	144.8	21.7	13.0%
1709000606	26	159.1	0.2	13.0%
1709000607	594	57.3	10.4	13.0%
1709000608	636	63.6	10.0	13.0%
1709000701	47,892	113.0	423.8	24.7%
1709000702	34,200	193.7	176.5	25.8%
1709000703	178,185	269.3	661.6	25.6%
1709000704	81,746	135.6	602.8	22.0%
1709000804	8,295	118.9	69.8	29.5%
1709000805	4,338	98.0	44.3	28.0%
1709000806	10,362	177.5	58.4	29.7%
1709000807	32,376	99.8	324.4	29.7%
1709000901	55,341	279.1	198.3	24.7%
1709000902	8,622	110.2	78.3	24.3%
1709000903	10,754	85.6	125.6	21.4%
1709000904	28,007	53.3	525.6	24.6%
1709000905	1,350	202.1	6.7	21.4%
1709000906	17,778	144.8	122.8	21.4%
1709001101	6	152.3	0.0	24.7%

Upper Willamette River chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1709001102	0	156.6	0.0	N/A
1709001103	215	141.2	1.5	21.4%
1709001104	156	216.6	0.7	21.4%
1709001105	5,107	90.1	56.7	21.4%
1709001106	52,639	184.0	286.1	21.4%
1709001201	292,787	94.0	3113.9	16.9%
1709001203	419,031	121.9	3438.1	13.1%

Upper Columbia River spring-run chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1702000505	5,734	263.4	21.8	21.1%
1702000801	2	167.8	0.0	18.6%
1702000802	94	188.2	0.5	18.6%
1702000803	0	223.9	0.0	N/A
1702000804	498	298.9	1.7	18.6%
1702000805	817	245.1	3.3	18.6%
1702000806	3,006	390.6	7.7	18.6%
1702000807	1,275	308.1	4.1	18.6%
1702001001	1,092	418.1	2.6	27.5%
1702001002	63,923	489.2	130.7	26.2%
1702001003	746	329.2	2.3	33.3%
1702001004	966	254.5	3.8	35.2%
1702001101	212	273.3	0.8	27.5%
1702001102	151	188.7	0.8	27.5%
1702001103	1,046	234.5	4.5	27.5%
1702001104	5,792	321.7	18.0	27.5%
1702001105	11,287	309.7	36.4	27.5%
1702001604	5,646	405.3	13.9	36.1%
1702001605	737	312.7	2.4	30.4%
1702001606	75,299	210.9	357.0	27.3%
1707010101	29,196	196.5	148.6	25.6%
1707010102	3,984	235.2	16.9	19.2%
1707010106	7,066	166.9	42.3	33.5%
1707010109	3,911	189.6	20.6	42.5%
1707010114	798	317.5	2.5	14.9%

Upper Columbia River spring-run chinook salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1707010501	1,025	149.7	6.8	2.4%
1707010504	20,031	204.3	98.1	10.3%
1707010512	8,372	144.9	57.8	17.0%
1707010513	3,482	132.1	26.4	19.6%
1708000107	8,997	162.5	55.4	36.3%

Oregon Coast coho salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1710020101	12,144	136.5	89.0	7.4%
1710020201	3,638	222.9	16.3	17.4%
1710020202	647	175.9	3.7	13.6%
1710020203	750	177.9	4.2	7.0%
1710020204	0	71.2	0.0	N/A
1710020205	444	97.2	4.6	10.5%
1710020206	2,041	107.5	19.0	12.5%
1710020301	380	61.0	6.2	12.9%
1710020302	2,961	256.9	11.5	12.5%
1710020303	1,733	60.8	28.5	12.5%
1710020304	7,672	174.9	43.9	12.5%
1710020305	1,221	192.2	6.4	12.5%
1710020306	335	65.0	5.2	12.5%
1710020307	205	36.0	5.7	12.5%
1710020308	2,936	20.4	143.8	12.5%
1710020309	3,663	79.8	45.9	12.5%
1710020401	615	83.2	7.4	14.4%
1710020402	262	88.9	2.9	14.4%
1710020403	7,050	76.1	92.6	14.4%
1710020405	125	64.9	1.9	14.4%
1710020406	160	43.1	3.7	14.4%
1710020407	4,725	189.7	24.9	14.4%
1710020408	2,902	74.6	38.9	14.4%
1710020409	19,480	63.9	304.8	14.4%
1710020501	592	127.1	4.7	10.4%
1710020502	189	119.4	1.6	12.9%
1710020503	164	69.3	2.4	14.4%

Oregon Coast coho salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1710020504	3,881	152.4	25.5	14.0%
1710020505	2,922	49.5	59.0	14.4%
1710020506	367	43.5	8.4	14.4%
1710020507	1,462	107.3	13.6	14.2%
1710020508	1,934	16.7	116.0	14.4%
1710020601	670	199.6	3.4	14.1%
1710020602	215	59.3	3.6	14.2%
1710020603	302	54.5	5.5	14.2%
1710020604	827	116.4	7.1	14.2%
1710020605	292	58.8	5.0	14.2%
1710020606	172	48.2	3.6	14.2%
1710020607	450	66.0	6.8	14.2%
1710020608	10,396	172.7	60.2	14.2%
1710020701	2,161	129.9	16.6	14.1%
1710030106	0	30.5	0.0	N/A
1710030107	149	196.3	0.8	6.1%
1710030108	0	163.6	0.0	N/A
1710030109	0	63.5	0.0	N/A
1710030110	34	98.1	0.3	6.1%
1710030111	1,230	206.2	6.0	6.1%
1710030112	15,592	165.7	94.1	6.1%
1710030201	2	136.1	0.0	6.1%
1710030202	4	160.0	0.0	6.1%
1710030203	154	154.7	1.0	6.1%
1710030204	136	85.0	1.6	6.1%
1710030205	3,226	221.2	14.6	6.1%
1710030207	2,590	176.8	14.7	6.1%
1710030208	0	87.2	0.0	N/A
1710030209	2,452	160.2	15.3	6.1%
1710030210	5,877	92.9	63.2	6.1%
1710030211	4,439	119.3	37.2	6.1%
1710030212	3,532	161.2	21.9	6.1%
1710030213	41,299	172.6	239.3	6.1%
1710030301	2,882	265.3	10.9	6.1%
1710030302	4,242	246.2	17.2	6.1%
1710030303	4,693	292.4	16.1	6.1%
1710030304	614	99.3	6.2	6.1%
1710030305	81	134.5	0.6	6.1%
1710030306	21	149.4	0.1	6.1%

Oregon Coast coho salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1710030307	306	220.3	1.4	6.1%
1710030308	5,573	106.1	52.5	6.1%
1710030401	0	210.8	0.0	N/A
1710030402	329	134.0	2.5	4.2%
1710030403	2,636	98.6	26.7	4.3%
1710030404	39,871	276.1	144.4	4.2%
1710030501	90	169.3	0.5	4.2%
1710030502	1,276	308.2	4.1	5.3%
1710030503	3,956	116.6	33.9	4.2%
1710030504	208	134.1	1.6	4.3%
1710030505	973	154.0	6.3	4.2%
1710030506	11,903	175.2	67.9	4.2%
1710030603	209	134.2	1.6	9.4%
1710030604	3,026	155.3	19.5	5.3%

Hood Canal Summer-run chum salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1711001701	2,320	236.1	9.8	28.9%
1711001802	1,232	75.5	16.3	28.7%
1711001803	35	84.0	0.4	28.9%
1711001804	325	78.6	4.1	27.2%
1711001805	266	116.3	2.3	27.2%
1711001806	505	69.8	7.2	27.2%
1711001807	2,715	124.7	21.8	27.2%
1711001808	28,231	227.1	124.3	23.8%
1711001908	16,274	79.2	205.6	27.2%
1711002001	5,295	78.8	67.2	24.9%
1711002002	4,009	52.6	76.3	14.8%
1711002003	15,477	214.9	72.0	14.8%
N15	1,105	6.8	162.3	26.0%
N16	184	0.9	216.3	28.9%
N17	409	2.6	156.8	28.7%
N18	828	11.0	75.3	25.9%
N19	215	2.5	87.4	14.8%

Columbia River chum salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1707010509	3,101	392.4	7.9	15.8%
1707010512	8,372	144.9	57.8	17.0%
1707010513	3,482	132.1	26.4	19.6%
1708000106	37,254	212.9	175.0	43.8%
1708000107	8,997	162.5	55.4	36.3%
1708000109	274,408	195.3	1405.2	45.0%
1708000205	23,308	234.4	99.4	45.0%
1708000206	11,623	221.6	52.4	29.1%
1708000301	6,771	232.1	29.2	13.2%
1708000304	42,971	147.6	291.1	13.2%
1708000305	2,033	158.3	12.8	14.9%
1708000503	6,386	208.5	30.6	15.6%
1708000504	3	147.1	0.0	13.2%
1708000505	2	131.6	0.0	13.2%
1708000506	226	125.8	1.8	13.2%
1708000507	12,965	274.3	47.3	14.4%
1708000508	30,454	210.4	144.8	13.2%
1708000602	10,146	116.4	87.2	7.0%
1708000603	1,820	184.2	9.9	12.7%

Ozette Lake sockeye salmon ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1710010102	85	101.0	0.8	14.8%

Upper Columbia River O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1702000503	492	333.9	1.5	24.4%
1702000504	2,447	219.3	11.2	23.8%
1702000505	5,734	263.4	21.8	21.1%
1702000601	5,462	289.0	18.9	18.6%

Upper Columbia River O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1702000602	3,251	401.7	8.1	18.6%
1702000603	1,480	164.9	9.0	18.6%
1702000604	11,862	469.0	25.3	18.6%
1702000605	3,268	312.9	10.4	18.6%
1702000704	192	68.4	2.8	18.6%
1702000801	2	167.8	0.0	18.6%
1702000802	94	188.2	0.5	18.6%
1702000803	0	223.9	0.0	N/A
1702000804	498	298.9	1.7	18.6%
1702000805	817	245.1	3.3	18.6%
1702000806	3,006	390.6	7.7	18.6%
1702000807	1,275	308.1	4.1	18.6%
1702000903	8,197	262.3	31.3	27.5%
1702001001	1,092	418.1	2.6	27.5%
1702001002	63,923	489.2	130.7	26.2%
1702001003	746	329.2	2.3	33.3%
1702001004	966	254.5	3.8	35.2%
1702001101	212	273.3	0.8	27.5%
1702001102	151	188.7	0.8	27.5%
1702001103	1,046	234.5	4.5	27.5%
1702001104	5,792	321.7	18.0	27.5%
1702001105	11,287	309.7	36.4	27.5%
1702001204	486	218.4	2.2	25.6%
1702001509	7,894	400.4	19.7	29.4%
1702001604	5,646	405.3	13.9	36.1%
1702001605	737	312.7	2.4	30.4%
1702001606	75,299	210.9	357.0	27.3%
1707010101	29,196	196.5	148.6	25.6%
1707010102	3,984	235.2	16.9	19.2%
1707010106	7,066	166.9	42.3	33.5%
1707010109	3,911	189.6	20.6	42.5%
1707010114	798	317.5	2.5	14.9%
1707010501	1,025	149.7	6.8	2.4%
1707010504	20,031	204.3	98.1	10.3%
1707010512	8,372	144.9	57.8	17.0%
1707010513	3,482	132.1	26.4	19.6%
1708000107	8,997	162.5	55.4	36.3%

Snake River Basin O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1702001606	75,299	210.9	357.0	27.3%
1706010101	30	199.1	0.2	4.9%
1706010102	19	180.0	0.1	12.7%
1706010104	2	161.7	0.0	12.7%
1706010201	66	138.7	0.5	4.6%
1706010202	52	137.5	0.4	4.6%
1706010203	0	139.1	0.0	N/A
1706010204	81	203.0	0.4	4.6%
1706010205	78	230.0	0.3	4.6%
1706010301	2	127.2	0.0	10.8%
1706010302	598	325.9	1.8	16.7%
1706010303	31,321	240.3	130.3	12.5%
1706010401	16	209.1	0.1	3.9%
1706010402	29	181.2	0.2	3.9%
1706010403	69	205.7	0.3	3.9%
1706010404	1,599	137.4	11.6	3.9%
1706010405	1,233	140.9	8.7	3.9%
1706010406	13,367	134.4	99.4	3.9%
1706010407	3,315	130.7	25.4	3.9%
1706010408	973	83.7	11.6	3.9%
1706010409	889	149.2	6.0	3.9%
1706010410	21	95.0	0.2	11.1%
1706010411	2,204	169.3	13.0	3.9%
1706010501	4,648	246.7	18.8	4.6%
1706010502	230	90.8	2.5	4.6%
1706010503	1,399	132.9	10.5	4.6%
1706010504	160	72.6	2.2	4.6%
1706010505	3	238.8	0.0	4.6%
1706010506	256	172.1	1.5	4.5%
1706010601	13	179.2	0.1	4.6%
1706010602	42	240.9	0.2	4.6%
1706010603	10	295.7	0.0	4.6%
1706010604	0	191.8	0.0	N/A
1706010605	82	195.7	0.4	4.6%
1706010606	21	163.8	0.1	13.8%
1706010607	228	251.0	0.9	11.1%
1706010701	187	129.2	1.4	12.3%
1706010702	10,885	169.1	64.4	16.5%
1706010703	270	206.6	1.3	6.6%

Snake River Basin O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1706010704	196	167.4	1.2	5.1%
1706010705	1,971	185.1	10.7	6.6%
1706010706	128	220.0	0.6	1.3%
1706010707	180	98.4	1.8	1.0%
1706010708	362	282.6	1.3	5.0%
1706010808	578	199.2	2.9	6.4%
1706011001	201	294.6	0.7	21.2%
1706011003	1,260	154.6	8.2	15.1%
1706011004	1,472	148.7	9.9	22.1%
1706020101	972	122.3	7.9	5.1%
1706020104	200	124.0	1.6	5.1%
1706020105	112	84.3	1.3	5.1%
1706020107	5	84.3	0.1	5.1%
1706020108	3	116.5	0.0	5.1%
1706020109	9	81.0	0.1	5.1%
1706020110	0	97.1	0.0	N/A
1706020111	0	50.4	0.0	N/A
1706020112	45	51.5	0.9	5.1%
1706020113	71	121.4	0.6	5.1%
1706020114	10	80.9	0.1	5.1%
1706020115	24	82.4	0.3	5.1%
1706020117	34	71.3	0.5	5.1%
1706020118	0	54.1	0.0	N/A
1706020119	27	107.4	0.3	34.9%
1706020120	0	70.1	0.0	N/A
1706020121	0	44.0	0.0	N/A
1706020122	137	59.1	2.3	5.1%
1706020123	0	85.3	0.0	N/A
1706020124	5	51.9	0.1	5.1%
1706020125	0	90.2	0.0	N/A
1706020126	3	57.0	0.1	5.1%
1706020127	0	43.3	0.0	N/A
1706020128	52	77.0	0.7	5.1%
1706020129	722	34.0	21.3	5.1%
1706020130	103	68.1	1.5	5.1%
1706020132	8	107.2	0.1	5.1%
1706020201	163	138.9	1.2	9.9%
1706020202	73	178.7	0.4	10.1%
1706020203	22	58.2	0.4	13.1%

Snake River Basin O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1706020301	7	50.9	0.1	13.1%
1706020302	19	51.0	0.4	13.1%
1706020303	10	131.1	0.1	13.1%
1706020304	3	53.7	0.1	13.1%
1706020305	190	150.3	1.3	13.1%
1706020306	217	210.8	1.0	13.1%
1706020307	342	59.0	5.8	13.1%
1706020308	121	55.0	2.2	13.1%
1706020309	3,356	75.8	44.3	13.1%
1706020310	456	84.4	5.4	13.1%
1706020311	194	89.4	2.2	13.1%
1706020312	158	145.1	1.1	13.0%
1706020313	0	76.7	0.0	N/A
1706020314	2	55.8	0.0	13.1%
1706020315	0	64.1	0.0	N/A
1706020316	0	40.9	0.0	N/A
1706020317	0	80.9	0.0	N/A
1706020318	3	37.6	0.1	13.1%
1706020319	1	85.9	0.0	13.1%
1706020320	0	44.0	0.0	N/A
1706020321	0	44.9	0.0	N/A
1706020322	5	83.3	0.1	13.1%
1706020323	3	48.2	0.1	13.1%
1706020401	1,415	104.0	13.6	13.1%
1706020402	438	101.1	4.3	13.1%
1706020403	126	80.4	1.6	13.1%
1706020404	1	45.4	0.0	13.1%
1706020405	77	55.0	1.4	13.1%
1706020406	90	81.9	1.1	13.1%
1706020407	51	76.2	0.7	13.1%
1706020408	106	108.2	1.0	13.1%
1706020409	62	64.3	1.0	13.1%
1706020414	58	142.6	0.4	13.1%
1706020501	0	71.1	0.0	N/A
1706020502	0	95.2	0.0	N/A
1706020503	1	128.0	0.0	5.1%
1706020504	0	43.2	0.0	N/A
1706020505	0	122.7	0.0	N/A
1706020506	90	150.3	0.6	5.1%

Snake River Basin O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1706020507	0	152.5	0.0	N/A
1706020508	1	192.0	0.0	25.2%
1706020509	0	51.0	0.0	N/A
1706020510	0	114.6	0.0	N/A
1706020511	2	83.9	0.0	25.2%
1706020512	0	117.7	0.0	N/A
1706020513	0	121.4	0.0	N/A
1706020601	0	153.9	0.0	N/A
1706020602	0	37.7	0.0	N/A
1706020603	0	88.4	0.0	N/A
1706020604	0	106.8	0.0	N/A
1706020605	3	52.3	0.1	13.1%
1706020606	0	132.4	0.0	N/A
1706020607	0	38.1	0.0	N/A
1706020608	0	66.5	0.0	N/A
1706020609	0	101.5	0.0	N/A
1706020610	0	95.1	0.0	N/A
1706020611	0	125.3	0.0	N/A
1706020612	0	35.3	0.0	N/A
1706020613	0	75.2	0.0	N/A
1706020614	0	43.7	0.0	N/A
1706020615	0	2.5	0.0	N/A
1706020616	0	63.2	0.0	N/A
1706020617	0	74.8	0.0	N/A
1706020701	2	43.8	0.0	12.7%
1706020702	0	62.9	0.0	N/A
1706020703	0	109.4	0.0	N/A
1706020704	0	52.4	0.0	N/A
1706020705	21	131.3	0.2	12.7%
1706020706	8	49.6	0.2	12.7%
1706020707	5	57.9	0.1	12.7%
1706020708	13	206.8	0.1	12.7%
1706020709	0	111.6	0.0	N/A
1706020710	0	56.2	0.0	N/A
1706020711	0	89.5	0.0	N/A
1706020712	0	61.9	0.0	N/A
1706020713	0	86.7	0.0	N/A
1706020714	2	141.1	0.0	13.1%
1706020715	0	68.9	0.0	N/A

Snake River Basin O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1706020716	0	60.3	0.0	N/A
1706020717	4	92.4	0.0	12.7%
1706020718	0	141.0	0.0	N/A
1706020719	4	87.6	0.0	12.7%
1706020801	9	146.4	0.1	18.3%
1706020802	1	132.1	0.0	25.2%
1706020803	0	74.5	0.0	N/A
1706020804	52	132.1	0.4	25.2%
1706020805	9	73.9	0.1	25.2%
1706020806	0	38.4	0.0	N/A
1706020807	0	102.0	0.0	N/A
1706020808	0	93.8	0.0	N/A
1706020809	0	71.3	0.0	N/A
1706020810	4	101.6	0.0	25.2%
1706020811	0	48.6	0.0	N/A
1706020812	0	50.8	0.0	N/A
1706020813	2	114.2	0.0	25.2%
1706020814	13	86.0	0.2	12.7%
1706020815	0	47.1	0.0	N/A
1706020901	0	63.0	0.0	N/A
1706020902	0	26.2	0.0	N/A
1706020903	7	39.4	0.2	10.8%
1706020904	20	57.3	0.3	6.6%
1706020905	157	96.3	1.6	12.5%
1706020906	386	91.0	4.2	12.7%
1706020907	100	42.7	2.3	12.7%
1706020908	292	105.6	2.8	12.7%
1706020909	171	64.1	2.7	12.7%
1706020910	13	32.5	0.4	12.7%
1706020911	30	132.6	0.2	12.7%
1706020912	307	141.8	2.2	12.7%
1706020913	359	73.5	4.9	12.7%
1706020914	2	35.5	0.1	12.7%
1706020915	0	56.9	0.0	N/A
1706020916	6	72.7	0.1	12.7%
1706020917	9	47.1	0.2	12.7%
1706021001	527	107.8	4.9	12.1%
1706021002	85	90.1	0.9	7.9%
1706021003	0	42.5	0.0	N/A

Snake River Basin O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1706021006	72	39.0	1.8	6.8%
1706021007	201	126.2	1.6	12.7%
1706030101	0	112.5	0.0	N/A
1706030102	0	178.8	0.0	N/A
1706030103	0	112.4	0.0	N/A
1706030104	0	131.1	0.0	N/A
1706030105	0	49.4	0.0	N/A
1706030106	0	205.0	0.0	N/A
1706030107	0	70.7	0.0	N/A
1706030108	0	91.2	0.0	N/A
1706030109	0	29.1	0.0	N/A
1706030201	4	110.5	0.0	12.7%
1706030202	0	47.5	0.0	N/A
1706030203	0	98.8	0.0	N/A
1706030204	0	27.1	0.0	N/A
1706030205	23	57.3	0.4	12.7%
1706030207	0	101.4	0.0	N/A
1706030208	0	113.6	0.0	N/A
1706030209	0	114.3	0.0	N/A
1706030210	0	33.4	0.0	N/A
1706030211	0	57.6	0.0	N/A
1706030212	1	68.9	0.0	12.7%
1706030213	0	115.7	0.0	N/A
1706030214	3	58.4	0.1	12.7%
1706030301	41	188.1	0.2	12.7%
1706030302	0	87.2	0.0	N/A
1706030303	0	129.5	0.0	N/A
1706030304	38	131.9	0.3	12.7%
1706030305	9	15.5	0.6	12.7%
1706030306	0	71.5	0.0	N/A
1706030307	0	77.1	0.0	N/A
1706030308	0	50.1	0.0	N/A
1706030309	0	49.4	0.0	N/A
1706030310	2	160.0	0.0	12.7%
1706030311	0	71.2	0.0	N/A
1706030312	0	52.0	0.0	N/A
1706030313	0	48.1	0.0	N/A
1706030314	0	44.2	0.0	N/A
1706030401	952	113.6	8.4	12.7%

Snake River Basin O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1706030402	607	103.1	5.9	12.7%
1706030501	2,237	156.3	14.3	12.7%
1706030502	1	41.1	0.0	12.7%
1706030503	0	78.1	0.0	N/A
1706030504	12	80.6	0.1	12.7%
1706030505	0	65.7	0.0	N/A
1706030506	406	91.7	4.4	12.7%
1706030507	21	161.6	0.1	12.7%
1706030508	3	70.8	0.0	12.7%
1706030509	0	54.0	0.0	N/A
1706030510	0	111.5	0.0	N/A
1706030511	1	38.3	0.0	12.7%
1706030512	3,252	34.6	94.1	12.7%
1706030513	2,814	191.5	14.7	12.7%
1706030601	10,239	79.9	128.2	10.8%
1706030602	324	83.1	3.9	13.0%
1706030603	1,880	65.7	28.6	14.0%
1706030604	1,650	91.3	18.1	14.1%
1706030606	1,027	125.6	8.2	13.1%
1706030607	641	180.0	3.6	14.1%
1706030608	675	79.4	8.5	9.4%
1706030609	357	48.5	7.4	10.7%
1706030610	602	132.6	4.5	8.7%
1706030611	793	94.1	8.4	6.9%
1706030612	5,155	78.1	66.0	5.1%
1706030613	1,170	152.9	7.7	5.0%
1706030614	1,136	99.4	11.4	5.0%
1706030615	237	72.7	3.3	5.8%
1706030616	58	53.9	1.1	12.7%
1706030617	11	54.3	0.2	5.0%
1706030618	0	33.2	0.0	N/A
1706030619	0	44.0	0.0	N/A
1706030620	421	42.0	10.0	5.1%
1706030621	348	55.2	6.3	10.7%
1706030622	1,992	51.6	38.6	11.5%
1706030623	1,388	64.7	21.5	7.6%
1706030624	275	61.9	4.4	12.3%
1706030627	334	65.8	5.1	10.8%
1706030630	114	70.6	1.6	10.8%

Snake River Basin O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1706030631	1,982	64.8	30.6	10.8%
1706030801	411	81.3	5.1	5.0%
1707010101	29,196	196.5	148.6	25.6%
1707010102	3,984	235.2	16.9	19.2%
1707010106	7,066	166.9	42.3	33.5%
1707010109	3,911	189.6	20.6	42.5%
1707010114	798	317.5	2.5	14.9%
1707010501	1,025	149.7	6.8	2.4%
1707010504	20,031	204.3	98.1	10.3%
1707010512	8,372	144.9	57.8	17.0%
1707010513	3,482	132.1	26.4	19.6%
1708000107	8,997	162.5	55.4	36.3%

Lower Columbia River O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1707010506	2,862	157.8	18.1	20.8%
1707010507	162	102.3	1.6	20.8%
1707010508	13,270	80.2	165.5	20.8%
1707010511	2,274	224.6	10.1	19.1%
1707010512	8,372	144.9	57.8	17.0%
1707010513	3,482	132.1	26.4	19.6%
1708000101	1,345	114.8	11.7	21.4%
1708000102	741	59.0	12.6	21.4%
1708000103	381	53.4	7.1	21.4%
1708000104	7,209	64.0	112.6	21.4%
1708000105	260	139.1	1.9	21.4%
1708000106	37,254	212.9	175.0	43.8%
1708000107	8,997	162.5	55.4	36.3%
1708000108	46,245	73.7	627.3	13.2%
1708000109	274,408	195.3	1405.2	45.0%
1708000205	23,308	234.4	99.4	45.0%
1708000206	11,623	221.6	52.4	29.1%
1708000301	6,771	232.1	29.2	13.2%
1708000401	126	216.0	0.6	15.6%
1708000402	1,233	167.2	7.4	15.6%

Lower Columbia River O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1708000403	1,934	207.0	9.3	15.6%
1708000404	0	242.6	0.0	N/A
1708000405	92	193.1	0.5	15.6%
1708000501	2,347	161.3	14.6	15.6%
1708000502	3,918	201.9	19.4	15.6%
1708000503	6,386	208.5	30.6	15.6%
1708000504	3	147.1	0.0	13.2%
1708000505	2	131.6	0.0	13.2%
1708000506	226	125.8	1.8	13.2%
1708000507	12,965	274.3	47.3	14.4%
1708000508	30,454	210.4	144.8	13.2%
1709000704	81,746	135.6	602.8	22.0%
1709001101	6	152.3	0.0	24.7%
1709001102	0	156.6	0.0	N/A
1709001103	215	141.2	1.5	21.4%
1709001104	156	216.6	0.7	21.4%
1709001105	5,107	90.1	56.7	21.4%
1709001106	52,639	184.0	286.1	21.4%
1709001201	292,787	94.0	3113.9	16.9%
1709001202	24,322	192.5	126.3	15.7%
1709001203	419,031	121.9	3438.1	13.1%

Upper Willamette O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1709000303	5,773	287.1	20.1	13.0%
1709000304	57,292	163.2	351.1	12.8%
1709000306	5,872	315.2	18.6	20.9%
1709000504	3,632	88.6	41.0	16.4%
1709000505	636	113.2	5.6	24.7%
1709000506	13,386	113.0	118.5	22.4%
1709000601	24,115	184.8	130.5	13.0%
1709000602	3,416	156.4	21.8	13.0%
1709000603	3,141	144.8	21.7	13.0%
1709000606	26	159.1	0.2	13.0%
1709000607	594	57.3	10.4	13.0%

Upper Willamette O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1709000608	636	63.6	10.0	13.0%
1709000701	47,892	113.0	423.8	24.7%
1709000702	34,200	193.7	176.5	25.8%
1709000703	178,185	269.3	661.6	25.6%
1709000704	81,746	135.6	602.8	22.0%
1709000801	2,544	139.9	18.2	26.6%
1709000802	2,078	84.1	24.7	29.1%
1709000803	816	53.5	15.3	26.0%
1709000804	8,295	118.9	69.8	29.5%
1709000805	4,338	98.0	44.3	28.0%
1709000806	10,362	177.5	58.4	29.7%
1709000807	32,376	99.8	324.4	29.7%
1709000901	55,341	279.1	198.3	24.7%
1709000902	8,622	110.2	78.3	24.3%
1709000903	10,754	85.6	125.6	21.4%
1709000904	28,007	53.3	525.6	24.6%
1709000905	1,350	202.1	6.7	21.4%
1709000906	17,778	144.8	122.8	21.4%
1709001001	41,067	231.2	177.6	42.8%
1709001002	19,217	94.3	203.8	42.9%
1709001003	5,385	136.0	39.6	40.5%
1709001004	248,042	151.3	1639.0	42.3%
1709001005	188,831	96.3	1961.0	35.6%
1709001201	292,787	94.0	3113.9	16.9%
1709001203	419,031	121.9	3438.1	13.1%

Middle Columbia River O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1702001606	75,299	210.9	357.0	27.3%
1703000101	2,230	484.0	4.6	24.8%
1703000102	4,760	256.5	18.6	24.8%
1703000103	26,098	850.0	30.7	24.8%
1703000104	17,274	548.3	31.5	17.9%
1703000201	17	343.1	0.0	19.5%
1703000202	1,035	300.1	3.4	17.9%

Middle Columbia River O. mykiss ESU				
Watershed	Population	Area (Sq miles)	Population Density	Population: percent change, 1990-2000
1703000203	13,462	461.0	29.2	17.9%
1703000301	35,880	233.1	153.9	17.9%
1703000302	75,805	172.9	438.4	17.9%
1703000303	2,846	394.8	7.2	17.9%
1703000304	37,827	374.5	101.0	17.9%
1703000305	42	558.8	0.1	17.8%
1703000306	56,509	663.3	85.2	20.7%
1703000307	33,923	506.0	67.0	26.6%
1707010101	29,196	196.5	148.6	25.6%
1707010102	3,984	235.2	16.9	19.2%
1707010105	548	428.7	1.3	25.2%
1707010106	7,066	166.9	42.3	33.5%
1707010109	3,911	189.6	20.6	42.5%
1707010110	211	198.7	1.1	15.9%
1707010111	93	63.0	1.5	15.3%
1707010112	59	64.9	0.9	15.3%
1707010113	437	226.2	1.9	15.3%
1707010114	798	317.5	2.5	14.9%
1707010201	421	158.1	2.7	19.1%
1707010202	24,455	118.9	205.6	13.9%
1707010203	3,052	228.3	13.4	1.0%
1707010204	2,161	146.6	14.7	11.1%
1707010207	616	146.5	4.2	13.9%
1707010208	27,836	137.5	202.4	15.1%
1707010209	2,974	172.1	17.3	18.9%
1707010210	921	237.1	3.9	13.9%
1707010211	3,659	179.5	20.4	17.9%
1707010301	88	135.5	0.6	19.1%
1707010302	78	178.4	0.4	19.1%
1707010303	17,012	205.4	82.8	19.1%
1707010304	2,390	195.5	12.2	19.1%
1707010305	4,255	198.8	21.4	19.1%
1707010306	2,072	284.7	7.3	19.1%
1707010307	1,296	207.9	6.2	19.1%
1707010308	1,681	110.0	15.3	19.1%
1707010310	280	126.8	2.2	24.5%
1707010313	21,436	184.8	116.0	19.1%
1707010501	1,025	149.7	6.8	2.4%
1707010502	1,113	241.7	4.6	9.7%

Middle Columbia River O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1707010503	322	122.2	2.6	9.7%
1707010504	20,031	204.3	98.1	10.3%
1707010505	1,159	66.3	17.5	12.7%
1707010512	8,372	144.9	57.8	17.0%
1707010513	3,482	132.1	26.4	19.6%
1707010601	0	349.9	0.0	N/A
1707010602	538	401.7	1.3	15.3%
1707010603	6,271	280.0	22.4	15.3%
1707010604	2,125	319.5	6.7	15.3%
1707020103	30	189.8	0.2	1.0%
1707020104	0	132.7	0.0	N/A
1707020105	200	135.4	1.5	1.0%
1707020106	129	166.8	0.8	1.0%
1707020107	1,450	115.6	12.5	1.0%
1707020108	2,526	234.0	10.8	1.0%
1707020109	443	110.8	4.0	1.0%
1707020110	1,572	169.2	9.3	1.0%
1707020111	225	173.3	1.3	1.0%
1707020112	14	109.8	0.1	1.0%
1707020113	27	182.9	0.1	10.8%
1707020114	4	113.4	0.0	10.8%
1707020115	55	157.2	0.3	3.3%
1707020201	0	111.5	0.0	N/A
1707020202	41	147.8	0.3	1.0%
1707020203	0	165.5	0.0	N/A
1707020204	0	108.9	0.0	N/A
1707020205	8	163.6	0.0	19.1%
1707020206	286	245.3	1.2	19.1%
1707020207	74	289.5	0.3	5.9%
1707020208	21	200.5	0.1	1.0%
1707020209	89	232.9	0.4	1.0%
1707020210	328	182.8	1.8	1.0%
1707020301	22	122.4	0.2	1.0%
1707020302	4	196.8	0.0	1.0%
1707020303	48	174.4	0.3	1.0%
1707020304	307	203.9	1.5	1.0%
1707020305	52	94.8	0.5	1.0%
1707020401	395	309.2	1.3	10.8%
1707020402	132	263.8	0.5	10.8%

Middle Columbia River O. mykiss ESU				
Watershed	**Population**	**Area (Sq miles)**	**Population Density**	**Population: percent change, 1990-2000**
1707020403	312	269.2	1.2	10.8%
1707020404	124	335.0	0.4	11.2%
1707020405	15	113.9	0.1	10.4%
1707020406	583	181.4	3.2	10.8%
1707020407	92	130.8	0.7	4.3%
1707020408	915	271.9	3.4	11.5%
1707020409	53	216.1	0.2	11.5%
1707020410	91	258.1	0.4	10.9%
1707020411	91	276.8	0.3	27.6%
1707020412	150	226.9	0.7	13.7%
1707020413	772	212.3	3.6	0.8%
1707020414	44	89.8	0.5	5.9%
1707030603	3,330	225.7	14.8	37.7%
1707030604	8	107.4	0.1	9.7%
1707030605	207	166.8	1.2	9.7%
1707030606	313	266.5	1.2	9.7%
1707030607	824	305.4	2.7	9.7%
1707030608	60	153.5	0.4	9.7%
1707030610	865	275.5	3.1	9.7%
1707030611	85	198.0	0.4	1.0%
1707030612	113	191.8	0.6	2.9%
1707030701	78	246.6	0.3	39.0%
1707030702	113	156.3	0.7	9.7%
1707030704	644	92.1	7.0	39.0%
1707030705	46	58.5	0.8	37.1%
1708000107	8,997	162.5	55.4	36.3%

Appendix C.2
Watershed Income and Employment (estimated)

Puget Sound chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1711000201	$2,024,709,881	47,984	1,703	11.4%	32.5%
1711000202	$1,016,933,313	21,612	1,037	11.1%	27.5%
1711000204	$372,021,399	8,830	312	11.4%	32.6%
1711000401	$3,385,887	80	3	11.4%	32.6%
1711000402	$3,267,500	78	3	11.4%	32.6%
1711000403	$26,897,678	638	23	11.4%	32.6%
1711000404	$121,323,679	2,880	102	11.4%	32.6%
1711000405	$1,116,300,974	26,495	936	11.4%	32.6%
1711000504	$0	0	0	N/A	N/A
1711000505	$8,791,444	188	9	11.1%	27.7%
1711000506	$3,849,258	81	4	11.1%	27.1%
1711000507	$23,339,514	492	24	11.1%	27.1%
1711000508	$3,415,539	72	4	11.1%	27.1%
1711000601	$265,666	4	0	7.2%	28.4%
1711000602	$0	0	0	N/A	N/A
1711000603	$162,645	3	0	11.1%	27.1%
1711000604	$60,196,619	1,003	18	8.0%	28.1%
1711000701	$389,262,969	8,213	401	11.1%	27.1%
1711000702	$1,353,956,253	28,299	1,352	11.0%	27.1%
1711000801	$112,662,348	1,760	13	7.2%	28.4%
1711000802	$286,949,027	4,481	34	7.2%	28.4%
1711000803	$803,906,930	12,581	98	7.2%	28.4%
1711000901	$3,887,713	71	0	8.0%	14.7%
1711000902	$40,734,080	703	3	7.6%	21.3%
1711000903	$242,228,548	3,783	28	7.2%	28.4%
1711000904	$70,401,546	1,100	8	7.2%	28.4%
1711000905	$692,385,183	10,813	81	7.2%	28.4%
1711001003	$825,658,675	15,066	23	8.0%	14.7%
1711001004	$885,123,223	15,920	32	7.9%	16.7%
1711001101	$1,303,948,802	20,365	153	7.2%	28.4%
1711001102	$5,244,073,899	81,900	615	7.2%	28.4%
1711001201	$2,561,270,782	46,737	71	8.0%	14.7%
1711001202	$4,663,791,481	85,103	129	8.0%	14.7%
1711001203	$29,374,595,723	536,015	812	8.0%	14.7%
1711001204	$13,276,295,432	225,479	939	7.5%	22.8%
1711001301	$0	0	0	N/A	N/A

Puget Sound chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1711001302	$97,330,028	1,776	3	8.0%	14.7%
1711001303	$16,920,880,211	308,765	468	8.0%	14.7%
1711001401	$9,694,735	176	1	10.9%	20.8%
1711001402	$2,140,726,987	38,980	122	9.5%	17.9%
1711001403	$433,049,463	7,855	47	11.0%	21.1%
1711001404	$290,138,110	5,263	31	11.0%	21.1%
1711001405	$8,418,915,345	153,049	662	10.2%	19.5%
1711001502	$216,783,097	3,990	31	10.6%	22.9%
1711001503	$1,532,517,739	28,692	284	10.2%	25.0%
1711001601	$71,076,123	1,385	20	9.0%	30.4%
1711001602	$1,758,024,774	34,261	505	9.0%	30.4%
1711001701	$49,196,679	831	15	12.2%	14.5%
1711001802	$27,032,942	461	8	12.1%	16.0%
1711001803	$742,191	13	0	12.2%	14.5%
1711001804	$9,045,339	164	2	11.4%	28.4%
1711001805	$7,403,262	134	2	11.4%	28.4%
1711001806	$14,055,065	255	4	11.4%	28.4%
1711001808	$715,541,359	12,922	86	9.6%	22.7%
1711001900	$884,602,716	15,345	263	11.7%	16.7%
1711001901	$6,182,884,750	113,094	523	9.3%	24.3%
1711001902	$2,171,032,444	42,310	624	9.0%	30.4%
1711001904	$14,893,764,690	265,920	639	7.9%	18.1%
1711002003	$380,885,072	7,652	108	12.3%	21.6%
1711002004	$731,918,520	14,704	207	12.3%	21.6%
1711002007	$32,730,965	658	9	12.3%	21.6%
N01	$23,140,473	548	19	11.4%	32.5%
N02	$39,493,337	697	17	8.1%	60.5%
N03	$43,588,778	920	45	11.1%	27.1%
N04	$1,416,886	22	0	7.2%	28.4%
N05	$44,565,861	774	9	6.6%	25.2%
N06	$15,644,788	244	2	7.2%	28.4%
N07	$59,076,660	1,069	2	7.9%	15.8%
N08	$100,989,051	1,843	3	8.0%	14.7%
N09	$14,137,581	256	2	11.0%	21.1%
N10	$2,835,381	55	1	9.1%	30.1%
N11	$9,795,702	178	1	11.0%	21.1%
N12	$14,386,094	280	4	9.0%	30.4%
N13	$19,280,388	342	6	11.3%	18.9%
N14	$254,130,334	4,639	21	9.5%	23.1%

Puget Sound chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
N15	$25,997,810	457	5	10.8%	19.1%
N16	$3,901,806	66	1	12.2%	14.5%
N17	$9,037,484	155	3	12.1%	16.4%
N18	$22,764,420	417	6	11.5%	27.7%
N19	$5,291,096	106	1	12.3%	21.6%

Lower Columbia River chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1707010506	$63,031,585	1,885	222	13.0%	3.3%
1707010507	$3,567,826	107	13	13.0%	3.3%
1707010508	$292,253,367	8,739	1,027	13.0%	3.3%
1707010509	$67,112,943	1,418	155	14.8%	19.3%
1707010510	$11,712,536	153	5	10.1%	16.7%
1707010511	$51,219,823	669	22	10.1%	16.7%
1707010512	$184,230,562	4,378	473	13.9%	12.6%
1707010513	$78,002,390	1,442	110	11.0%	12.3%
1708000101	$47,489,346	758	30	6.4%	25.6%
1708000102	$26,163,275	418	17	6.4%	25.6%
1708000103	$13,452,372	215	9	6.4%	25.6%
1708000104	$254,535,832	4,062	163	6.4%	25.6%
1708000105	$9,180,097	146	6	6.4%	25.6%
1708000106	$1,074,692,797	16,860	204	9.1%	43.1%
1708000107	$255,057,390	4,253	52	9.6%	35.4%
1708000108	$1,534,282,056	38,542	110	12.1%	13.0%
1708000109	$8,001,318,337	126,326	1,445	9.0%	44.4%
1708000205	$679,625,695	10,730	123	9.0%	44.4%
1708000206	$306,266,056	5,712	75	10.9%	30.2%
1708000301	$159,474,796	3,537	51	12.8%	16.0%
1708000302	$383,347,427	5,318	356	8.6%	20.6%
1708000303	$67,054,255	930	62	8.6%	20.6%
1708000304	$1,011,853,406	22,432	331	12.8%	16.0%
1708000305	$45,111,441	877	93	10.2%	19.8%
1708000306	$30,009,792	640	17	11.6%	15.9%
1708000401	$2,680,345	63	3	14.2%	16.1%
1708000402	$26,229,091	617	32	14.2%	16.1%

Lower Columbia River chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1708000403	$41,141,170	968	49	14.2%	16.1%
1708000404	$0	0	0	N/A	N/A
1708000405	$1,957,077	46	2	14.2%	16.1%
1708000501	$49,926,746	1,175	60	14.2%	16.1%
1708000502	$83,345,969	1,962	100	14.2%	16.1%
1708000503	$136,008,580	3,199	162	14.2%	16.1%
1708000504	$70,658	2	0	12.8%	16.0%
1708000505	$47,105	1	0	12.8%	16.0%
1708000506	$5,322,892	118	2	12.8%	16.0%
1708000507	$290,956,712	6,636	212	13.5%	16.0%
1708000508	$717,271,514	15,909	230	12.8%	16.0%
1708000601	$297,914,640	7,673	112	13.3%	13.3%
1708000602	$247,170,001	6,366	93	13.3%	13.3%
1708000603	$39,010,399	813	53	13.4%	15.7%
1709000704	$2,857,639,909	46,155	1,836	6.6%	26.0%
1709001105	$180,318,282	2,877	115	6.4%	25.6%
1709001106	$1,858,581,168	29,659	1,190	6.4%	25.6%
1709001201	$9,997,248,818	208,109	3,385	9.5%	18.7%
1709001202	$645,167,980	9,914	526	9.0%	19.8%
1709001203	$13,886,918,047	351,179	850	12.2%	12.8%

Upper Willamette River chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1709000101	$0	0	0	N/A	N/A
1709000102	$51,348	1	0	13.3%	19.1%
1709000103	$1,335,051	30	1	13.3%	19.1%
1709000104	$28,421,178	647	11	13.3%	19.1%
1709000105	$60,051,614	1,367	24	13.3%	19.1%
1709000106	$18,485,319	421	7	13.3%	19.1%
1709000107	$84,570,336	1,925	33	13.3%	19.1%
1709000108	$9,602,096	219	4	13.3%	19.1%
1709000109	$22,644,516	515	9	13.3%	19.1%
1709000110	$283,929,370	6,462	111	13.3%	19.1%
1709000201	$67,009,283	1,525	26	13.3%	19.1%
1709000202	$17,715,098	403	7	13.3%	19.1%

Upper Willamette River chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1709000203	$306,419,842	6,974	120	13.3%	19.1%
1709000205	$347,601,025	7,911	136	13.3%	19.1%
1709000301	$2,892,528,012	65,806	1,140	13.2%	19.1%
1709000302	$4,346,193,275	98,315	2,060	12.2%	18.8%
1709000303	$128,413,893	2,969	173	12.3%	16.6%
1709000304	$1,307,671,250	30,109	1,660	12.0%	16.7%
1709000305	$843,302,136	18,738	472	9.1%	18.3%
1709000306	$154,398,157	2,758	154	10.0%	25.5%
1709000401	$6,699,161	153	3	13.3%	19.0%
1709000402	$5,571,270	127	2	13.3%	19.1%
1709000403	$0	0	0	N/A	N/A
1709000404	$4,082,175	93	2	13.3%	19.1%
1709000405	$15,532,803	354	6	13.3%	19.1%
1709000406	$79,512,547	1,810	31	13.3%	19.1%
1709000407	$677,358,583	15,416	265	13.3%	19.1%
1709000504	$82,698,530	1,924	105	12.6%	18.9%
1709000505	$15,291,290	361	17	13.2%	24.5%
1709000506	$317,180,684	7,461	366	13.0%	23.0%
1709000601	$536,411,057	12,400	724	12.3%	16.6%
1709000602	$75,985,079	1,757	103	12.3%	16.6%
1709000603	$69,868,013	1,615	94	12.3%	16.6%
1709000606	$578,341	13	1	12.3%	16.6%
1709000607	$13,212,862	305	18	12.3%	16.6%
1709000608	$14,147,105	327	19	12.3%	16.6%
1709000701	$1,151,463,008	27,190	1,277	13.2%	24.5%
1709000702	$842,453,826	13,414	1,042	10.7%	28.6%
1709000703	$4,281,488,133	94,229	5,365	12.5%	25.9%
1709000704	$2,857,639,909	46,155	1,836	6.6%	26.0%
1709000804	$194,932,440	3,793	377	10.5%	30.4%
1709000805	$104,098,224	1,840	170	10.5%	29.8%
1709000806	$243,000,799	4,773	477	10.5%	30.5%
1709000807	$759,254,379	14,912	1,491	10.5%	30.5%
1709000901	$1,330,558,638	31,420	1,475	13.2%	24.5%
1709000902	$220,478,194	4,890	225	12.3%	24.6%
1709000903	$379,702,918	6,059	243	6.4%	25.6%
1709000904	$680,601,987	15,898	744	13.0%	24.5%
1709000905	$47,665,886	761	31	6.4%	25.6%
1709000906	$627,706,757	10,017	402	6.4%	25.6%
1709001101	$144,257	3	0	13.2%	24.5%

Upper Willamette River chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1709001102	$0	0	0	N/A	N/A
1709001103	$7,591,234	121	5	6.4%	25.6%
1709001104	$5,508,058	88	4	6.4%	25.6%
1709001105	$180,318,282	2,877	115	6.4%	25.6%
1709001106	$1,858,581,168	29,659	1,190	6.4%	25.6%
1709001201	$9,997,248,818	208,109	3,385	9.5%	18.7%
1709001203	$13,886,918,047	351,179	850	12.2%	12.8%

Upper Columbia River spring-run chinook salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1702000505	$120,980,929	3,123	543	16.1%	17.2%
1702000801	$40,300	1	0	18.5%	14.8%
1702000802	$1,894,084	54	10	18.5%	14.8%
1702000803	$0	0	0	N/A	N/A
1702000804	$10,034,617	284	52	18.5%	14.8%
1702000805	$16,462,414	466	85	18.5%	14.8%
1702000806	$60,570,399	1,715	313	18.5%	14.8%
1702000807	$25,691,037	727	133	18.5%	14.8%
1702001001	$26,749,508	765	78	13.6%	21.4%
1702001002	$1,492,010,980	35,405	4,799	12.1%	21.5%
1702001003	$15,581,954	394	63	14.1%	25.7%
1702001004	$19,272,771	496	81	14.7%	27.2%
1702001101	$5,193,128	148	15	13.6%	21.4%
1702001102	$3,698,879	106	11	13.6%	21.4%
1702001103	$25,622,698	732	74	13.6%	21.4%
1702001104	$141,880,177	4,055	411	13.6%	21.4%
1702001105	$276,485,075	7,902	802	13.6%	21.4%
1702001604	$111,871,092	2,894	496	14.9%	27.5%
1702001605	$14,007,012	389	67	17.4%	16.7%
1702001606	$1,870,976,238	40,826	2,964	10.7%	23.5%
1707010101	$752,387,437	15,982	924	9.7%	23.6%
1707010102	$86,978,136	2,193	178	15.5%	13.9%
1707010106	$144,067,053	3,592	526	10.5%	20.7%
1707010109	$75,107,521	1,865	374	7.5%	25.0%
1707010114	$13,564,050	517	122	10.4%	14.5%

Upper Columbia River spring-run chinook salmon ESU					
Watershed	**Personal income**	**Total employment**	**Farm employ ment**	**Persons below poverty level (%)**	**Housing % change, 1990-2000**
1707010501	$14,970,003	649	163	12.4%	5.7%
1707010504	$478,233,120	10,657	810	13.2%	3.6%
1707010512	$184,230,562	4,378	473	13.9%	12.6%
1707010513	$78,002,390	1,442	110	11.0%	12.3%
1708000107	$255,057,390	4,253	52	9.6%	35.4%

Oregon Coast coho salmon ESU					
Watershed	**Personal income**	**Total employment**	**Farm employ ment**	**Persons below poverty level (%)**	**Housing % change, 1990-2000**
1710020101	$294,411,863	7,525	126	13.3%	13.7%
1710020201	$94,875,493	1,351	84	8.5%	21.8%
1710020202	$16,423,016	277	13	9.8%	18.7%
1710020203	$18,270,994	471	7	13.3%	13.3%
1710020204	$0	0	0	N/A	N/A
1710020205	$10,321,459	246	9	13.5%	17.2%
1710020206	$46,126,331	1,044	56	13.6%	19.4%
1710020301	$8,608,740	193	10	13.5%	19.7%
1710020302	$66,918,209	1,514	81	13.6%	19.4%
1710020303	$39,165,571	886	48	13.6%	19.4%
1710020304	$173,386,188	3,924	211	13.6%	19.4%
1710020305	$27,603,815	625	34	13.6%	19.4%
1710020306	$7,570,956	171	9	13.6%	19.4%
1710020307	$4,632,973	105	6	13.6%	19.4%
1710020308	$66,353,213	1,502	81	13.6%	19.4%
1710020309	$82,783,317	1,873	101	13.6%	19.4%
1710020401	$14,695,506	349	5	14.6%	20.1%
1710020402	$6,245,671	148	2	14.7%	20.1%
1710020403	$168,061,006	3,993	62	14.7%	20.1%
1710020405	$2,979,805	71	1	14.7%	20.1%
1710020406	$3,814,150	91	1	14.7%	20.1%
1710020407	$112,636,632	2,676	42	14.7%	20.1%
1710020408	$69,139,520	1,642	26	14.7%	20.1%
1710020409	$464,372,823	11,034	172	14.7%	20.1%
1710020501	$17,552,403	390	10	9.1%	18.3%
1710020502	$4,999,121	114	2	12.3%	19.2%
1710020503	$3,909,504	93	1	14.7%	20.1%

Oregon Coast coho salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1710020504	$94,678,638	2,233	37	14.2%	19.9%
1710020505	$69,655,923	1,655	26	14.7%	20.1%
1710020506	$8,748,708	208	3	14.7%	20.1%
1710020507	$37,384,947	853	15	13.4%	19.2%
1710020508	$46,103,544	1,095	17	14.7%	20.1%
1710020601	$17,175,772	391	7	13.3%	19.0%
1710020602	$5,519,922	126	2	13.3%	19.1%
1710020603	$7,753,564	176	3	13.3%	19.1%
1710020604	$21,232,443	483	8	13.3%	19.1%
1710020605	$7,496,824	171	3	13.3%	19.1%
1710020606	$4,415,937	101	2	13.3%	19.1%
1710020607	$11,553,325	263	5	13.3%	19.1%
1710020608	$266,907,472	6,074	104	13.3%	19.1%
1710020701	$55,397,636	1,261	22	13.3%	19.0%
1710030106	$0	0	0	N/A	N/A
1710030107	$3,344,074	79	4	14.6%	13.0%
1710030108	$0	0	0	N/A	N/A
1710030109	$0	0	0	N/A	N/A
1710030110	$763,077	18	1	14.6%	13.0%
1710030111	$27,605,444	651	32	14.6%	13.0%
1710030112	$349,938,282	8,246	403	14.6%	13.0%
1710030201	$44,887	1	0	14.6%	13.0%
1710030202	$89,774	2	0	14.6%	13.0%
1710030203	$3,456,291	81	4	14.6%	13.0%
1710030204	$3,052,309	72	4	14.6%	13.0%
1710030205	$72,402,572	1,706	83	14.6%	13.0%
1710030207	$58,128,537	1,370	67	14.6%	13.0%
1710030208	$0	0	0	N/A	N/A
1710030209	$55,031,341	1,297	63	14.6%	13.0%
1710030210	$131,900,159	3,108	152	14.6%	13.0%
1710030211	$99,626,477	2,348	115	14.6%	13.0%
1710030212	$79,270,268	1,868	91	14.6%	13.0%
1710030213	$926,892,068	21,843	1,067	14.6%	13.0%
1710030301	$64,682,025	1,524	74	14.6%	13.0%
1710030302	$95,205,118	2,244	110	14.6%	13.0%
1710030303	$105,336,806	2,482	121	14.6%	13.0%
1710030304	$13,780,279	325	16	14.6%	13.0%
1710030305	$1,817,920	43	2	14.6%	13.0%
1710030306	$471,312	11	1	14.6%	13.0%

Oregon Coast coho salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1710030307	$6,867,696	162	8	14.6%	13.0%
1710030308	$125,077,350	2,948	144	14.6%	13.0%
1710030401	$0	0	0	N/A	N/A
1710030402	$7,292,298	163	5	16.7%	9.7%
1710030403	$58,462,959	1,308	42	16.6%	9.9%
1710030404	$883,742,281	19,723	622	16.7%	9.7%
1710030501	$1,994,854	45	1	16.7%	9.7%
1710030502	$28,479,705	655	27	15.5%	11.5%
1710030503	$87,684,895	1,957	62	16.7%	9.7%
1710030504	$4,611,999	103	3	16.6%	9.8%
1710030505	$21,566,583	481	15	16.7%	9.7%
1710030506	$263,830,462	5,888	186	16.7%	9.7%
1710030603	$5,042,470	103	3	13.9%	15.4%
1710030604	$68,338,609	1,497	47	16.1%	10.9%

Hood Canal Summer-run chum salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1711001701	$49,196,679	831	15	12.2%	14.5%
1711001802	$27,032,942	461	8	12.1%	16.0%
1711001803	$742,191	13	0	12.2%	14.5%
1711001804	$9,045,339	164	2	11.4%	28.4%
1711001805	$7,403,262	134	2	11.4%	28.4%
1711001806	$14,055,065	255	4	11.4%	28.4%
1711001807	$75,563,368	1,371	20	11.4%	28.4%
1711001808	$715,541,359	12,922	86	9.6%	22.7%
1711001908	$452,934,898	8,221	122	11.4%	28.4%
1711002001	$144,250,484	2,664	39	11.6%	27.2%
1711002002	$98,660,480	1,982	28	12.3%	21.6%
1711002003	$380,885,072	7,652	108	12.3%	21.6%
N15	$25,997,810	457	5	10.8%	19.1%
N16	$3,901,806	66	1	12.2%	14.5%
N17	$9,037,484	155	3	12.1%	16.4%
N18	$22,764,420	417	6	11.5%	27.7%
N19	$5,291,096	106	1	12.3%	21.6%

Columbia River chum salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1707010509	$67,112,943	1,418	155	14.8%	19.3%
1707010512	$184,230,562	4,378	473	13.9%	12.6%
1707010513	$78,002,390	1,442	110	11.0%	12.3%
1708000106	$1,074,692,797	16,860	204	9.1%	43.1%
1708000107	$255,057,390	4,253	52	9.6%	35.4%
1708000109	$8,001,318,337	126,326	1,445	9.0%	44.4%
1708000205	$679,625,695	10,730	123	9.0%	44.4%
1708000206	$306,266,056	5,712	75	10.9%	30.2%
1708000301	$159,474,796	3,537	51	12.8%	16.0%
1708000304	$1,011,853,406	22,432	331	12.8%	16.0%
1708000305	$45,111,441	877	93	10.2%	19.8%
1708000503	$136,008,580	3,199	162	14.2%	16.1%
1708000504	$70,658	2	0	12.8%	16.0%
1708000505	$47,105	1	0	12.8%	16.0%
1708000506	$5,322,892	118	2	12.8%	16.0%
1708000507	$290,956,712	6,636	212	13.5%	16.0%
1708000508	$717,271,514	15,909	230	12.8%	16.0%
1708000602	$247,170,001	6,366	93	13.3%	13.3%
1708000603	$39,010,399	813	53	13.4%	15.7%

Ozette Lake sockeye salmon ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1710010102	$2,091,829	42	1	12.3%	21.6%

Upper Columbia River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1702000503	$10,664,311	169	40	10.0%	21.7%
1702000504	$52,672,105	894	204	10.8%	21.0%
1702000505	$120,980,929	3,123	543	16.1%	17.2%
1702000601	$110,058,389	3,116	570	18.5%	14.8%

Upper Columbia River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1702000602	$65,507,108	1,855	339	18.5%	14.8%
1702000603	$29,821,753	844	154	18.5%	14.8%
1702000604	$239,017,321	6,768	1,237	18.5%	14.8%
1702000605	$65,849,655	1,865	341	18.5%	14.8%
1702000704	$3,868,768	110	20	18.5%	14.8%
1702000801	$40,300	1	0	18.5%	14.8%
1702000802	$1,894,084	54	10	18.5%	14.8%
1702000803	$0	0	0	N/A	N/A
1702000804	$10,034,617	284	52	18.5%	14.8%
1702000805	$16,462,414	466	85	18.5%	14.8%
1702000806	$60,570,399	1,715	313	18.5%	14.8%
1702000807	$25,691,037	727	133	18.5%	14.8%
1702000903	$200,792,785	5,739	582	13.6%	21.4%
1702001001	$26,749,508	765	78	13.6%	21.4%
1702001002	$1,492,010,980	35,405	4,799	12.1%	21.5%
1702001003	$15,581,954	394	63	14.1%	25.7%
1702001004	$19,272,771	496	81	14.7%	27.2%
1702001101	$5,193,128	148	15	13.6%	21.4%
1702001102	$3,698,879	106	11	13.6%	21.4%
1702001103	$25,622,698	732	74	13.6%	21.4%
1702001104	$141,880,177	4,055	411	13.6%	21.4%
1702001105	$276,485,075	7,902	802	13.6%	21.4%
1702001204	$10,438,147	175	40	10.5%	22.3%
1702001509	$158,613,508	4,180	790	15.1%	19.6%
1702001604	$111,871,092	2,894	496	14.9%	27.5%
1702001605	$14,007,012	389	67	17.4%	16.7%
1702001606	$1,870,976,238	40,826	2,964	10.7%	23.5%
1707010101	$752,387,437	15,982	924	9.7%	23.6%
1707010102	$86,978,136	2,193	178	15.5%	13.9%
1707010106	$144,067,053	3,592	526	10.5%	20.7%
1707010109	$75,107,521	1,865	374	7.5%	25.0%
1707010114	$13,564,050	517	122	10.4%	14.5%
1707010501	$14,970,003	649	163	12.4%	5.7%
1707010504	$478,233,120	10,657	810	13.2%	3.6%
1707010512	$184,230,562	4,378	473	13.9%	12.6%
1707010513	$78,002,390	1,442	110	11.0%	12.3%
1708000107	$255,057,390	4,253	52	9.6%	35.4%

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1702001606	$1,870,976,238	40,826	2,964	10.7%	23.5%
1706010101	$646,638	19	3	13.3%	4.4%
1706010102	$354,681	10	1	17.6%	18.8%
1706010104	$37,335	1	0	17.6%	18.8%
1706010201	$1,429,175	41	6	13.1%	3.9%
1706010202	$1,126,017	33	5	13.1%	3.9%
1706010203	$0	0	0	N/A	N/A
1706010204	$1,753,987	51	8	13.1%	3.9%
1706010205	$1,689,025	49	7	13.1%	3.9%
1706010301	$50,469	1	0	12.8%	12.0%
1706010302	$14,371,249	222	8	15.6%	21.2%
1706010303	$779,566,977	19,502	484	13.6%	14.6%
1706010401	$365,647	10	1	13.9%	6.3%
1706010402	$662,736	18	1	13.9%	6.3%
1706010403	$1,576,854	43	3	13.9%	6.3%
1706010404	$36,541,876	998	77	13.9%	6.3%
1706010405	$28,177,694	769	59	13.9%	6.3%
1706010406	$305,475,457	8,340	641	13.9%	6.3%
1706010407	$75,757,548	2,068	159	13.9%	6.3%
1706010408	$22,235,926	607	47	13.9%	6.3%
1706010409	$20,316,277	555	43	13.9%	6.3%
1706010410	$468,770	12	1	14.7%	9.8%
1706010411	$50,367,914	1,375	106	13.9%	6.3%
1706010501	$100,648,561	2,922	441	13.1%	3.9%
1706010502	$4,980,458	145	22	13.1%	3.9%
1706010503	$30,294,178	880	133	13.1%	3.9%
1706010504	$3,464,666	101	15	13.1%	3.9%
1706010505	$64,962	2	0	13.1%	3.9%
1706010506	$5,579,430	161	23	13.2%	4.2%
1706010601	$281,504	8	1	13.1%	3.9%
1706010602	$909,475	26	4	13.1%	3.9%
1706010603	$216,542	6	1	13.1%	3.9%
1706010604	$0	0	0	N/A	N/A
1706010605	$1,775,642	52	8	13.1%	3.9%
1706010606	$492,843	9	1	15.0%	17.1%
1706010607	$5,228,679	112	12	14.4%	13.2%
1706010701	$4,321,512	86	13	13.6%	14.8%
1706010702	$260,992,163	4,062	154	15.6%	21.1%
1706010703	$5,912,403	156	38	10.9%	6.5%

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1706010704	$3,978,372	106	9	14.5%	14.2%
1706010705	$43,173,823	1,142	277	10.9%	6.5%
1706010706	$3,070,742	78	13	12.4%	-1.0%
1706010707	$4,340,020	110	18	12.5%	-1.4%
1706010708	$7,472,690	199	20	14.1%	12.7%
1706010808	$11,724,663	313	28	14.6%	14.0%
1706011001	$4,208,326	111	15	15.8%	13.0%
1706011003	$28,213,197	716	70	14.7%	11.5%
1706011004	$30,740,178	810	102	16.0%	14.1%
1706020101	$21,989,765	593	82	12.1%	22.4%
1706020104	$4,524,643	122	17	12.1%	22.4%
1706020105	$2,533,800	68	9	12.1%	22.4%
1706020107	$113,116	3	0	12.1%	22.4%
1706020108	$67,870	2	0	12.1%	22.4%
1706020109	$203,609	5	1	12.1%	22.4%
1706020110	$0	0	0	N/A	N/A
1706020111	$0	0	0	N/A	N/A
1706020112	$1,018,045	27	4	12.1%	22.4%
1706020113	$1,606,248	43	6	12.1%	22.4%
1706020114	$226,232	6	1	12.1%	22.4%
1706020115	$542,957	15	2	12.1%	22.4%
1706020117	$769,189	21	3	12.1%	22.4%
1706020118	$0	0	0	N/A	N/A
1706020119	$1,069,934	24	1	8.2%	27.4%
1706020120	$0	0	0	N/A	N/A
1706020121	$0	0	0	N/A	N/A
1706020122	$3,099,380	84	12	12.1%	22.4%
1706020123	$0	0	0	N/A	N/A
1706020124	$113,116	3	0	12.1%	22.4%
1706020125	$0	0	0	N/A	N/A
1706020126	$67,870	2	0	12.1%	22.4%
1706020127	$0	0	0	N/A	N/A
1706020128	$1,176,407	32	4	12.1%	22.4%
1706020129	$16,333,961	440	61	12.1%	22.4%
1706020130	$2,330,191	63	9	12.1%	22.4%
1706020132	$180,986	5	1	12.1%	22.4%
1706020201	$3,390,485	94	12	14.3%	15.4%
1706020202	$1,510,602	42	5	14.4%	15.0%
1706020203	$430,327	12	1	15.8%	10.7%

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1706020301	$136,922	4	0	15.8%	10.7%
1706020302	$371,646	11	1	15.8%	10.7%
1706020303	$195,603	6	1	15.8%	10.7%
1706020304	$58,681	2	0	15.8%	10.7%
1706020305	$3,716,464	105	12	15.8%	10.7%
1706020306	$4,244,593	120	14	15.8%	10.7%
1706020307	$6,689,636	190	22	15.8%	10.7%
1706020308	$2,366,801	67	8	15.8%	10.7%
1706020309	$65,644,495	1,862	212	15.8%	10.7%
1706020310	$8,919,514	253	29	15.8%	10.7%
1706020311	$3,794,706	108	12	15.8%	10.7%
1706020312	$3,096,659	88	10	15.8%	10.8%
1706020313	$0	0	0	N/A	N/A
1706020314	$39,121	1	0	15.8%	10.7%
1706020315	$0	0	0	N/A	N/A
1706020316	$0	0	0	N/A	N/A
1706020317	$0	0	0	N/A	N/A
1706020318	$58,681	2	0	15.8%	10.7%
1706020319	$19,560	1	0	15.8%	10.7%
1706020320	$0	0	0	N/A	N/A
1706020321	$0	0	0	N/A	N/A
1706020322	$97,802	3	0	15.8%	10.7%
1706020323	$58,681	2	0	15.8%	10.7%
1706020401	$27,677,879	785	89	15.8%	10.7%
1706020402	$8,567,428	243	28	15.8%	10.7%
1706020403	$2,464,603	70	8	15.8%	10.7%
1706020404	$19,560	1	0	15.8%	10.7%
1706020405	$1,506,146	43	5	15.8%	10.7%
1706020406	$1,760,430	50	6	15.8%	10.7%
1706020407	$997,577	28	3	15.8%	10.7%
1706020408	$2,073,396	59	7	15.8%	10.7%
1706020409	$1,212,741	34	4	15.8%	10.7%
1706020414	$1,134,500	32	4	15.8%	10.7%
1706020501	$0	0	0	N/A	N/A
1706020502	$0	0	0	N/A	N/A
1706020503	$22,623	1	0	12.1%	22.4%
1706020504	$0	0	0	N/A	N/A
1706020505	$0	0	0	N/A	N/A
1706020506	$2,036,089	55	8	12.1%	22.4%

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1706020507	$0	0	0	N/A	N/A
1706020508	$27,454	1	0	13.8%	21.7%
1706020509	$0	0	0	N/A	N/A
1706020510	$0	0	0	N/A	N/A
1706020511	$54,907	1	0	13.8%	21.7%
1706020512	$0	0	0	N/A	N/A
1706020513	$0	0	0	N/A	N/A
1706020601	$0	0	0	N/A	N/A
1706020602	$0	0	0	N/A	N/A
1706020603	$0	0	0	N/A	N/A
1706020604	$0	0	0	N/A	N/A
1706020605	$58,681	2	0	15.8%	10.7%
1706020606	$0	0	0	N/A	N/A
1706020607	$0	0	0	N/A	N/A
1706020608	$0	0	0	N/A	N/A
1706020609	$0	0	0	N/A	N/A
1706020610	$0	0	0	N/A	N/A
1706020611	$0	0	0	N/A	N/A
1706020612	$0	0	0	N/A	N/A
1706020613	$0	0	0	N/A	N/A
1706020614	$0	0	0	N/A	N/A
1706020615	$0	0	0	N/A	N/A
1706020616	$0	0	0	N/A	N/A
1706020617	$0	0	0	N/A	N/A
1706020701	$37,335	1	0	17.6%	18.8%
1706020702	$0	0	0	N/A	N/A
1706020703	$0	0	0	N/A	N/A
1706020704	$0	0	0	N/A	N/A
1706020705	$392,015	11	1	17.6%	18.8%
1706020706	$149,339	4	1	17.6%	18.8%
1706020707	$93,337	3	0	17.6%	18.8%
1706020708	$242,676	7	1	17.6%	18.8%
1706020709	$0	0	0	N/A	N/A
1706020710	$0	0	0	N/A	N/A
1706020711	$0	0	0	N/A	N/A
1706020712	$0	0	0	N/A	N/A
1706020713	$0	0	0	N/A	N/A
1706020714	$39,121	1	0	15.8%	10.7%
1706020715	$0	0	0	N/A	N/A

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1706020716	$0	0	0	N/A	N/A
1706020717	$74,670	2	0	17.6%	18.8%
1706020718	$0	0	0	N/A	N/A
1706020719	$74,670	2	0	17.6%	18.8%
1706020801	$203,152	6	0	15.9%	20.1%
1706020802	$27,454	1	0	13.8%	21.7%
1706020803	$0	0	0	N/A	N/A
1706020804	$1,427,591	38	1	13.8%	21.7%
1706020805	$247,083	7	0	13.8%	21.7%
1706020806	$0	0	0	N/A	N/A
1706020807	$0	0	0	N/A	N/A
1706020808	$0	0	0	N/A	N/A
1706020809	$0	0	0	N/A	N/A
1706020810	$109,815	3	0	13.8%	21.7%
1706020811	$0	0	0	N/A	N/A
1706020812	$0	0	0	N/A	N/A
1706020813	$54,907	1	0	13.8%	21.7%
1706020814	$242,676	7	1	17.6%	18.8%
1706020815	$0	0	0	N/A	N/A
1706020901	$0	0	0	N/A	N/A
1706020902	$0	0	0	N/A	N/A
1706020903	$176,642	5	0	12.8%	12.0%
1706020904	$432,447	11	1	15.2%	6.8%
1706020905	$2,945,556	83	10	17.5%	18.4%
1706020906	$7,205,615	203	25	17.6%	18.8%
1706020907	$1,866,740	53	6	17.6%	18.8%
1706020908	$5,450,880	154	19	17.6%	18.8%
1706020909	$3,192,125	90	11	17.6%	18.8%
1706020910	$242,676	7	1	17.6%	18.8%
1706020911	$560,022	16	2	17.6%	18.8%
1706020912	$5,730,891	162	20	17.6%	18.8%
1706020913	$6,701,596	189	23	17.6%	18.8%
1706020914	$37,335	1	0	17.6%	18.8%
1706020915	$0	0	0	N/A	N/A
1706020916	$112,004	3	0	17.6%	18.8%
1706020917	$168,007	5	1	17.6%	18.8%
1706021001	$10,006,598	282	36	16.4%	17.5%
1706021002	$1,787,637	51	8	8.8%	9.1%
1706021003	$0	0	0	N/A	N/A

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1706021006	$1,553,696	44	7	6.8%	6.8%
1706021007	$3,752,147	106	13	17.6%	18.8%
1706030101	$0	0	0	N/A	N/A
1706030102	$0	0	0	N/A	N/A
1706030103	$0	0	0	N/A	N/A
1706030104	$0	0	0	N/A	N/A
1706030105	$0	0	0	N/A	N/A
1706030106	$0	0	0	N/A	N/A
1706030107	$0	0	0	N/A	N/A
1706030108	$0	0	0	N/A	N/A
1706030109	$0	0	0	N/A	N/A
1706030201	$74,670	2	0	17.6%	18.8%
1706030202	$0	0	0	N/A	N/A
1706030203	$0	0	0	N/A	N/A
1706030204	$0	0	0	N/A	N/A
1706030205	$429,350	12	1	17.6%	18.8%
1706030207	$0	0	0	N/A	N/A
1706030208	$0	0	0	N/A	N/A
1706030209	$0	0	0	N/A	N/A
1706030210	$0	0	0	N/A	N/A
1706030211	$0	0	0	N/A	N/A
1706030212	$18,667	1	0	17.6%	18.8%
1706030213	$0	0	0	N/A	N/A
1706030214	$56,002	2	0	17.6%	18.8%
1706030301	$765,363	22	3	17.6%	18.8%
1706030302	$0	0	0	N/A	N/A
1706030303	$0	0	0	N/A	N/A
1706030304	$709,361	20	2	17.6%	18.8%
1706030305	$168,007	5	1	17.6%	18.8%
1706030306	$0	0	0	N/A	N/A
1706030307	$0	0	0	N/A	N/A
1706030308	$0	0	0	N/A	N/A
1706030309	$0	0	0	N/A	N/A
1706030310	$37,335	1	0	17.6%	18.8%
1706030311	$0	0	0	N/A	N/A
1706030312	$0	0	0	N/A	N/A
1706030313	$0	0	0	N/A	N/A
1706030314	$0	0	0	N/A	N/A
1706030401	$17,771,362	501	61	17.6%	18.8%

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1706030402	$11,331,110	319	39	17.6%	18.8%
1706030501	$41,758,968	1,177	142	17.6%	18.8%
1706030502	$18,667	1	0	17.6%	18.8%
1706030503	$0	0	0	N/A	N/A
1706030504	$224,009	6	1	17.6%	18.8%
1706030505	$0	0	0	N/A	N/A
1706030506	$7,578,963	214	26	17.6%	18.8%
1706030507	$392,015	11	1	17.6%	18.8%
1706030508	$56,002	2	0	17.6%	18.8%
1706030509	$0	0	0	N/A	N/A
1706030510	$0	0	0	N/A	N/A
1706030511	$18,667	1	0	17.6%	18.8%
1706030512	$60,706,376	1,711	207	17.6%	18.8%
1706030513	$52,530,056	1,481	179	17.6%	18.8%
1706030601	$258,376,690	7,420	167	12.8%	12.0%
1706030602	$7,306,391	205	7	13.3%	15.0%
1706030603	$39,963,976	1,108	48	13.5%	16.5%
1706030604	$34,932,108	967	42	13.5%	16.6%
1706030606	$22,604,556	631	24	13.4%	15.4%
1706030607	$13,570,595	376	16	13.5%	16.6%
1706030608	$16,197,525	458	12	13.3%	11.3%
1706030609	$8,987,974	258	6	12.8%	12.0%
1706030610	$14,093,099	382	26	14.0%	9.4%
1706030611	$17,331,486	445	49	15.0%	7.4%
1706030612	$103,670,645	2,737	128	14.9%	8.9%
1706030613	$23,450,573	618	29	14.9%	8.9%
1706030614	$22,769,104	600	28	14.9%	8.9%
1706030615	$4,715,849	125	7	15.2%	9.9%
1706030616	$1,082,709	31	4	17.6%	18.8%
1706030617	$220,475	6	0	14.9%	8.9%
1706030618	$0	0	0	N/A	N/A
1706030619	$0	0	0	N/A	N/A
1706030620	$8,488,730	223	12	14.9%	8.7%
1706030621	$6,830,166	185	23	16.8%	14.9%
1706030622	$38,302,433	1,056	129	17.1%	16.5%
1706030623	$29,349,929	753	94	15.6%	8.7%
1706030624	$5,183,769	145	18	17.5%	18.1%
1706030627	$8,428,344	242	5	12.8%	12.0%
1706030630	$2,876,740	83	2	12.8%	12.0%

Snake River Basin O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1706030631	$50,014,904	1,436	32	12.8%	12.0%
1706030801	$8,237,766	217	10	14.9%	8.9%
1707010101	$752,387,437	15,982	924	9.7%	23.6%
1707010102	$86,978,136	2,193	178	15.5%	13.9%
1707010106	$144,067,053	3,592	526	10.5%	20.7%
1707010109	$75,107,521	1,865	374	7.5%	25.0%
1707010114	$13,564,050	517	122	10.4%	14.5%
1707010501	$14,970,003	649	163	12.4%	5.7%
1707010504	$478,233,120	10,657	810	13.2%	3.6%
1707010512	$184,230,562	4,378	473	13.9%	12.6%
1707010513	$78,002,390	1,442	110	11.0%	12.3%
1708000107	$255,057,390	4,253	52	9.6%	35.4%

Lower Columbia River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1707010506	$63,031,585	1,885	222	13.0%	3.3%
1707010507	$3,567,826	107	13	13.0%	3.3%
1707010508	$292,253,367	8,739	1,027	13.0%	3.3%
1707010511	$51,219,823	669	22	10.1%	16.7%
1707010512	$184,230,562	4,378	473	13.9%	12.6%
1707010513	$78,002,390	1,442	110	11.0%	12.3%
1708000101	$47,489,346	758	30	6.4%	25.6%
1708000102	$26,163,275	418	17	6.4%	25.6%
1708000103	$13,452,372	215	9	6.4%	25.6%
1708000104	$254,535,832	4,062	163	6.4%	25.6%
1708000105	$9,180,097	146	6	6.4%	25.6%
1708000106	$1,074,692,797	16,860	204	9.1%	43.1%
1708000107	$255,057,390	4,253	52	9.6%	35.4%
1708000108	$1,534,282,056	38,542	110	12.1%	13.0%
1708000109	$8,001,318,337	126,326	1,445	9.0%	44.4%
1708000205	$679,625,695	10,730	123	9.0%	44.4%
1708000206	$306,266,056	5,712	75	10.9%	30.2%
1708000301	$159,474,796	3,537	51	12.8%	16.0%
1708000401	$2,680,345	63	3	14.2%	16.1%
1708000402	$26,229,091	617	32	14.2%	16.1%

Lower Columbia River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1708000403	$41,141,170	968	49	14.2%	16.1%
1708000404	$0	0	0	N/A	N/A
1708000405	$1,957,077	46	2	14.2%	16.1%
1708000501	$49,926,746	1,175	60	14.2%	16.1%
1708000502	$83,345,969	1,962	100	14.2%	16.1%
1708000503	$136,008,580	3,199	162	14.2%	16.1%
1708000504	$70,658	2	0	12.8%	16.0%
1708000505	$47,105	1	0	12.8%	16.0%
1708000506	$5,322,892	118	2	12.8%	16.0%
1708000507	$290,956,712	6,636	212	13.5%	16.0%
1708000508	$717,271,514	15,909	230	12.8%	16.0%
1709000704	$2,857,639,909	46,155	1,836	6.6%	26.0%
1709001101	$144,257	3	0	13.2%	24.5%
1709001102	$0	0	0	N/A	N/A
1709001103	$7,591,234	121	5	6.4%	25.6%
1709001104	$5,508,058	88	4	6.4%	25.6%
1709001105	$180,318,282	2,877	115	6.4%	25.6%
1709001106	$1,858,581,168	29,659	1,190	6.4%	25.6%
1709001201	$9,997,248,818	208,109	3,385	9.5%	18.7%
1709001202	$645,167,980	9,914	526	9.0%	19.8%
1709001203	$13,886,918,047	351,179	850	12.2%	12.8%

Upper Willamette River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1709000303	$128,413,893	2,969	173	12.3%	16.6%
1709000304	$1,307,671,250	30,109	1,660	12.0%	16.7%
1709000306	$154,398,157	2,758	154	10.0%	25.5%
1709000504	$82,698,530	1,924	105	12.6%	18.9%
1709000505	$15,291,290	361	17	13.2%	24.5%
1709000506	$317,180,684	7,461	366	13.0%	23.0%
1709000601	$536,411,057	12,400	724	12.3%	16.6%
1709000602	$75,985,079	1,757	103	12.3%	16.6%
1709000603	$69,868,013	1,615	94	12.3%	16.6%
1709000606	$578,341	13	1	12.3%	16.6%
1709000607	$13,212,862	305	18	12.3%	16.6%

Upper Willamette River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1709000608	$14,147,105	327	19	12.3%	16.6%
1709000701	$1,151,463,008	27,190	1,277	13.2%	24.5%
1709000702	$842,453,826	13,414	1,042	10.7%	28.6%
1709000703	$4,281,488,133	94,229	5,365	12.5%	25.9%
1709000704	$2,857,639,909	46,155	1,836	6.6%	26.0%
1709000801	$62,181,563	1,003	86	10.5%	29.2%
1709000802	$49,128,056	931	91	10.5%	30.3%
1709000803	$20,106,076	311	26	10.5%	29.0%
1709000804	$194,932,440	3,793	377	10.5%	30.4%
1709000805	$104,098,224	1,840	170	10.5%	29.8%
1709000806	$243,000,799	4,773	477	10.5%	30.5%
1709000807	$759,254,379	14,912	1,491	10.5%	30.5%
1709000901	$1,330,558,638	31,420	1,475	13.2%	24.5%
1709000902	$220,478,194	4,890	225	12.3%	24.6%
1709000903	$379,702,918	6,059	243	6.4%	25.6%
1709000904	$680,601,987	15,898	744	13.0%	24.5%
1709000905	$47,665,886	761	31	6.4%	25.6%
1709000906	$627,706,757	10,017	402	6.4%	25.6%
1709001001	$1,313,235,027	25,736	394	6.7%	43.4%
1709001002	$614,476,717	12,036	185	6.7%	43.5%
1709001003	$163,962,881	3,213	87	7.4%	41.2%
1709001004	$7,930,008,894	156,218	2,375	6.8%	42.9%
1709001005	$6,149,584,272	122,723	1,921	7.5%	36.6%
1709001201	$9,997,248,818	208,109	3,385	9.5%	18.7%
1709001203	$13,886,918,047	351,179	850	12.2%	12.8%

Middle Columbia River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1702001606	$1,870,976,238	40,826	2,964	10.7%	23.5%
1703000101	$47,805,366	1,165	98	13.3%	24.7%
1703000102	$102,041,947	2,486	210	13.3%	24.7%
1703000103	$559,472,844	13,631	1,151	13.3%	24.7%
1703000104	$382,810,762	8,935	1,237	18.3%	11.8%
1703000201	$373,896	9	1	17.1%	14.8%
1703000202	$22,940,920	535	74	18.3%	11.7%

Middle Columbia River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1703000203	$298,387,113	6,963	966	18.3%	11.7%
1703000301	$795,285,219	18,559	2,575	18.3%	11.7%
1703000302	$1,680,228,429	39,210	5,440	18.3%	11.7%
1703000303	$63,081,988	1,472	204	18.3%	11.7%
1703000304	$838,440,746	19,566	2,714	18.3%	11.7%
1703000305	$929,639	22	3	18.2%	12.1%
1703000306	$1,322,982,866	29,738	3,292	15.4%	15.9%
1703000307	$883,436,307	18,496	1,010	9.3%	24.7%
1707010101	$752,387,437	15,982	924	9.7%	23.6%
1707010102	$86,978,136	2,193	178	15.5%	13.9%
1707010105	$13,951,991	296	19	10.4%	23.3%
1707010106	$144,067,053	3,592	526	10.5%	20.7%
1707010109	$75,107,521	1,865	374	7.5%	25.0%
1707010110	$4,569,839	103	13	16.1%	18.0%
1707010111	$2,001,046	45	5	15.5%	19.7%
1707010112	$1,269,481	28	3	15.5%	19.7%
1707010113	$9,402,764	210	24	15.5%	19.7%
1707010114	$13,564,050	517	122	10.4%	14.5%
1707010201	$9,152,018	232	19	15.6%	13.7%
1707010202	$553,703,136	13,972	1,300	14.5%	11.1%
1707010203	$73,587,445	1,865	299	12.5%	-1.4%
1707010204	$49,629,852	1,254	136	14.1%	8.4%
1707010207	$13,948,962	352	33	14.5%	11.1%
1707010208	$624,527,471	15,771	1,429	14.8%	11.7%
1707010209	$64,747,976	1,639	135	15.6%	13.6%
1707010210	$20,855,509	526	49	14.5%	11.1%
1707010211	$80,294,723	2,032	172	15.4%	13.1%
1707010301	$1,913,011	48	4	15.6%	13.7%
1707010302	$1,695,623	43	4	15.6%	13.7%
1707010303	$369,819,775	9,365	767	15.6%	13.7%
1707010304	$51,955,635	1,316	108	15.6%	13.7%
1707010305	$92,498,421	2,342	192	15.6%	13.7%
1707010306	$45,042,710	1,141	93	15.6%	13.7%
1707010307	$28,173,432	713	58	15.6%	13.7%
1707010308	$36,542,855	925	76	15.6%	13.7%
1707010310	$5,922,598	150	16	13.8%	16.2%
1707010313	$465,992,047	11,800	966	15.6%	13.7%
1707010501	$14,970,003	649	163	12.4%	5.7%
1707010502	$26,884,767	599	43	12.9%	1.7%

Middle Columbia River O. mykiss ESU					
Watershed	Personal income	Total employment	Farm employ ment	Persons below poverty level (%)	Housing % change, 1990-2000
1707010503	$7,777,983	173	12	12.9%	1.7%
1707010504	$478,233,120	10,657	810	13.2%	3.6%
1707010505	$27,320,187	662	57	12.9%	2.1%
1707010512	$184,230,562	4,378	473	13.9%	12.6%
1707010513	$78,002,390	1,442	110	11.0%	12.3%
1707010601	$0	0	0	N/A	N/A
1707010602	$11,577,240	259	30	15.5%	19.7%
1707010603	$134,930,738	3,013	351	15.5%	19.7%
1707010604	$45,722,822	1,021	119	15.5%	19.7%
1707020103	$633,822	17	2	14.5%	6.1%
1707020104	$0	0	0	N/A	N/A
1707020105	$4,225,482	112	15	14.5%	6.1%
1707020106	$2,725,436	72	9	14.5%	6.1%
1707020107	$30,634,745	811	106	14.5%	6.1%
1707020108	$53,367,838	1,412	184	14.5%	6.1%
1707020109	$9,359,443	248	32	14.5%	6.1%
1707020110	$33,212,289	879	115	14.5%	6.1%
1707020111	$4,753,667	126	16	14.5%	6.1%
1707020112	$295,784	8	1	14.5%	6.1%
1707020113	$484,167	13	5	12.5%	7.7%
1707020114	$71,729	2	1	12.5%	7.7%
1707020115	$1,120,469	30	5	14.0%	6.5%
1707020201	$0	0	0	N/A	N/A
1707020202	$866,224	23	3	14.5%	6.1%
1707020203	$0	0	0	N/A	N/A
1707020204	$0	0	0	N/A	N/A
1707020205	$173,910	4	0	15.6%	13.7%
1707020206	$6,217,285	157	13	15.6%	13.7%
1707020207	$1,575,655	41	5	14.8%	8.2%
1707020208	$443,676	12	2	14.5%	6.1%
1707020209	$1,880,340	50	6	14.5%	6.1%
1707020210	$6,929,791	183	24	14.5%	6.1%
1707020301	$464,803	12	2	14.5%	6.1%
1707020302	$84,510	2	0	14.5%	6.1%
1707020303	$1,014,116	27	4	14.5%	6.1%
1707020304	$6,486,115	172	22	14.5%	6.1%
1707020305	$1,098,625	29	4	14.5%	6.1%
1707020401	$7,083,190	193	67	12.5%	7.7%
1707020402	$2,367,041	65	23	12.5%	7.7%

Middle Columbia River O. mykiss ESU					
Watershed	**Personal income**	**Total employment**	**Farm employ ment**	**Persons below poverty level (%)**	**Housing % change, 1990-2000**
1707020403	$5,594,824	153	53	12.5%	7.7%
1707020404	$2,560,210	63	14	12.8%	5.9%
1707020405	$305,384	8	2	12.1%	5.7%
1707020406	$10,418,633	289	100	12.4%	7.8%
1707020407	$1,638,068	56	11	12.4%	3.0%
1707020408	$14,264,877	649	170	9.5%	11.8%
1707020409	$823,922	38	10	9.4%	11.9%
1707020410	$1,405,544	65	17	9.5%	11.5%
1707020411	$1,586,860	53	13	8.5%	18.2%
1707020412	$2,366,409	105	27	9.2%	12.8%
1707020413	$10,594,043	504	133	12.0%	3.9%
1707020414	$642,085	30	8	10.8%	7.7%
1707030603	$61,071,223	1,537	133	16.4%	30.5%
1707030604	$193,242	4	0	12.9%	1.7%
1707030605	$5,000,132	111	8	12.9%	1.7%
1707030606	$7,560,586	168	12	12.9%	1.7%
1707030607	$19,903,907	443	32	12.9%	1.7%
1707030608	$1,449,314	32	2	12.9%	1.7%
1707030610	$20,894,271	466	33	12.9%	1.7%
1707030611	$1,187,307	55	14	12.0%	3.8%
1707030612	$1,832,357	71	16	12.2%	3.4%
1707030701	$1,409,995	36	3	16.6%	31.8%
1707030702	$2,729,541	61	4	12.9%	1.7%
1707030704	$11,641,497	295	26	16.6%	31.8%
1707030705	$849,771	21	2	16.4%	29.8%
1708000107	$255,057,390	4,253	52	9.6%	35.4%

Appendix C.3
Watershed Land Ownership

Puget Sound chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1711000201	0.00%	83.31%	16.69%	0.00%	0.00%
1711000202	0.00%	82.22%	12.56%	5.18%	0.04%
1711000204	0.00%	95.93%	3.52%	0.49%	0.06%
1711000401	89.13%	8.54%	2.33%	0.00%	0.00%
1711000402	45.72%	22.14%	32.14%	0.00%	0.00%
1711000403	21.13%	58.82%	19.72%	0.33%	0.00%
1711000404	0.00%	58.98%	39.97%	1.05%	0.00%
1711000405	0.00%	88.39%	0.73%	10.83%	0.06%
1711000504	98.88%	1.12%	0.00%	0.00%	0.00%
1711000505	91.82%	8.02%	0.17%	0.00%	0.00%
1711000506	84.70%	8.67%	6.63%	0.00%	0.00%
1711000507	55.51%	38.56%	5.93%	0.00%	0.00%
1711000508	83.07%	10.86%	3.55%	0.00%	0.00%
1711000601	98.57%	0.86%	0.57%	0.00%	0.00%
1711000602	100.00%	0.00%	0.00%	0.00%	0.00%
1711000603	87.36%	7.52%	5.12%	0.00%	0.00%
1711000604	59.28%	24.80%	15.87%	0.05%	0.00%
1711000701	20.26%	64.21%	15.49%	0.04%	0.00%
1711000702	0.00%	86.74%	13.26%	0.01%	0.00%
1711000801	48.46%	29.15%	22.38%	0.00%	0.00%
1711000802	53.45%	39.11%	7.44%	0.00%	0.00%
1711000803	0.00%	81.84%	18.06%	0.09%	0.01%
1711000901	89.64%	9.20%	1.16%	0.00%	0.00%
1711000902	86.63%	12.26%	1.11%	0.00%	0.00%
1711000903	18.60%	54.97%	26.43%	0.00%	0.00%
1711000904	24.46%	11.53%	64.01%	0.00%	0.00%
1711000905	0.63%	80.14%	19.23%	0.00%	0.00%
1711001003	41.17%	50.80%	8.03%	0.00%	0.00%
1711001004	6.67%	76.90%	16.43%	0.00%	0.00%
1711001101	0.21%	65.48%	34.31%	0.00%	0.00%
1711001102	0.05%	91.82%	0.97%	7.06%	0.09%
1711001201	14.57%	27.42%	58.01%	0.00%	0.00%
1711001202	0.00%	80.69%	19.31%	0.00%	0.00%
1711001203	0.13%	93.53%	6.34%	0.00%	0.00%
1711001204	0.24%	98.65%	1.11%	0.00%	0.00%
1711001301	35.78%	54.81%	9.41%	0.00%	0.00%
1711001302	3.72%	65.48%	30.80%	0.00%	0.00%

Puget Sound chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1711001303	0.00%	96.29%	3.13%	0.56%	0.02%
1711001401	86.83%	13.09%	0.08%	0.00%	0.00%
1711001402	10.87%	85.03%	1.64%	2.37%	0.09%
1711001403	31.23%	68.02%	0.75%	0.00%	0.00%
1711001404	32.10%	67.57%	0.33%	0.00%	0.00%
1711001405	0.00%	77.09%	0.36%	22.28%	0.28%
1711001502	0.00%	83.50%	16.50%	0.00%	0.00%
1711001503	32.44%	63.40%	1.21%	2.94%	0.01%
1711001601	0.97%	99.01%	0.02%	0.00%	0.00%
1711001602	9.99%	88.38%	1.64%	0.00%	0.00%
1711001701	67.52%	27.80%	2.47%	2.20%	0.00%
1711001802	20.43%	32.71%	43.62%	2.94%	0.29%
1711001803	85.10%	4.85%	10.05%	0.00%	0.00%
1711001804	88.32%	9.42%	2.21%	0.00%	0.05%
1711001805	92.48%	7.08%	0.44%	0.00%	0.00%
1711001806	88.52%	6.27%	5.20%	0.00%	0.01%
1711001808	3.33%	68.51%	27.34%	0.80%	0.02%
1711001900	0.00%	93.13%	6.63%	0.19%	0.05%
1711001901	1.53%	90.09%	5.32%	3.04%	0.01%
1711001902	0.00%	90.49%	9.50%	0.00%	0.01%
1711001904	0.81%	97.05%	2.13%	0.00%	0.01%
1711002003	75.28%	20.33%	3.84%	0.00%	0.55%
1711002004	38.75%	43.54%	16.14%	0.00%	1.57%
1711002007	91.36%	5.32%	2.90%	0.19%	0.23%
N01	0.00%	72.83%	3.84%	21.46%	1.87%
N02	3.04%	91.94%	4.94%	0.00%	0.08%
N03	0.00%	53.78%	33.24%	12.39%	0.59%
N04	0.00%	91.36%	8.41%	0.23%	0.01%
N05	14.31%	80.47%	5.17%	0.00%	0.04%
N06	0.00%	61.84%	0.00%	35.93%	2.23%
N07	0.00%	91.34%	8.62%	0.00%	0.05%
N08	0.00%	98.82%	1.14%	0.00%	0.04%
N09	0.00%	40.09%	0.00%	59.55%	0.37%
N10	50.37%	30.13%	19.43%	0.00%	0.06%
N11	8.35%	85.11%	6.51%	0.00%	0.03%
N12	0.00%	93.54%	6.41%	0.00%	0.04%
N13	0.00%	89.81%	2.53%	7.55%	0.11%
N14	1.57%	92.86%	1.84%	3.59%	0.14%
N15	1.61%	93.26%	1.98%	2.03%	1.12%
N16	0.00%	98.60%	0.00%	0.00%	1.40%

Puget Sound chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
N17	0.00%	58.27%	1.65%	22.16%	17.92%
N18	3.24%	38.96%	2.75%	0.10%	54.95%
N19	12.75%	5.39%	0.50%	4.14%	77.22%

Lower Columbia River chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1707010506	70.22%	28.85%	0.92%	0.00%	0.00%
1707010507	67.32%	32.23%	0.02%	0.00%	0.00%
1707010508	11.92%	87.96%	0.11%	0.00%	0.00%
1707010509	47.79%	33.92%	18.17%	0.11%	0.02%
1707010510	79.41%	16.24%	4.36%	0.00%	0.00%
1707010511	89.26%	8.22%	2.50%	0.00%	0.02%
1707010512	25.79%	63.35%	10.09%	0.17%	0.59%
1707010513	54.61%	25.35%	19.92%	0.00%	0.12%
1708000101	93.19%	6.70%	0.11%	0.00%	0.00%
1708000102	96.79%	3.21%	0.00%	0.00%	0.00%
1708000103	89.87%	10.13%	0.00%	0.00%	0.00%
1708000104	27.03%	72.97%	0.00%	0.00%	0.00%
1708000105	87.81%	11.69%	0.00%	0.00%	0.00%
1708000106	7.62%	61.96%	30.40%	0.00%	0.01%
1708000107	39.99%	39.78%	15.66%	0.00%	4.56%
1708000108	15.87%	81.04%	1.38%	0.00%	1.71%
1708000109	1.77%	93.07%	5.15%	0.00%	0.01%
1708000205	20.30%	63.80%	15.89%	0.00%	0.00%
1708000206	17.37%	69.86%	12.76%	0.00%	0.00%
1708000301	8.00%	87.00%	4.99%	0.00%	0.00%
1708000302	0.00%	99.08%	0.00%	0.00%	0.92%
1708000303	1.14%	95.03%	3.58%	0.00%	0.25%
1708000304	0.10%	82.29%	17.61%	0.00%	0.00%
1708000305	2.19%	74.71%	23.09%	0.00%	0.01%
1708000306	0.00%	61.73%	36.18%	0.00%	2.09%
1708000401	99.91%	0.09%	0.00%	0.00%	0.00%
1708000402	92.49%	6.69%	0.82%	0.00%	0.00%
1708000403	62.11%	36.02%	1.87%	0.00%	0.00%
1708000404	99.91%	0.00%	0.00%	0.06%	0.03%
1708000405	91.38%	8.05%	0.57%	0.00%	0.00%
1708000501	17.69%	74.83%	7.48%	0.00%	0.00%

Lower Columbia River chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1708000502	7.02%	85.15%	7.83%	0.00%	0.00%
1708000503	0.00%	94.06%	5.94%	0.00%	0.00%
1708000504	46.61%	35.97%	17.42%	0.00%	0.00%
1708000505	22.90%	74.09%	3.01%	0.00%	0.00%
1708000506	10.31%	62.12%	27.57%	0.00%	0.00%
1708000507	0.07%	95.06%	4.88%	0.00%	0.00%
1708000508	0.00%	99.08%	0.92%	0.00%	0.00%
1708000601	0.49%	85.77%	11.58%	0.00%	2.15%
1708000602	0.00%	72.26%	25.35%	0.00%	2.39%
1708000603	0.00%	89.36%	10.64%	0.00%	0.00%
1709000704	0.32%	99.68%	0.00%	0.00%	0.00%
1709001105	37.03%	62.82%	0.15%	0.00%	0.00%
1709001106	5.70%	94.30%	0.00%	0.00%	0.00%
1709001201	0.00%	100.00%	0.00%	0.00%	0.00%
1709001202	5.23%	85.18%	8.51%	0.00%	1.09%
1709001203	0.00%	99.30%	0.00%	0.00%	0.70%

Upper Willamette River chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1709000101	89.99%	10.01%	0.00%	0.00%	0.00%
1709000102	95.04%	4.96%	0.00%	0.00%	0.00%
1709000103	99.76%	0.24%	0.00%	0.00%	0.00%
1709000104	97.56%	2.44%	0.00%	0.00%	0.00%
1709000105	82.54%	17.46%	0.00%	0.00%	0.00%
1709000106	93.79%	6.21%	0.00%	0.00%	0.00%
1709000107	59.83%	39.85%	0.32%	0.00%	0.00%
1709000108	22.86%	77.14%	0.00%	0.00%	0.00%
1709000109	80.15%	19.61%	0.24%	0.00%	0.00%
1709000110	13.05%	86.95%	0.00%	0.00%	0.00%
1709000201	60.00%	40.00%	0.00%	0.00%	0.00%
1709000202	27.62%	72.38%	0.00%	0.00%	0.00%
1709000203	25.61%	74.39%	0.00%	0.00%	0.00%
1709000205	5.92%	94.08%	0.00%	0.00%	0.00%
1709000301	7.85%	92.13%	0.03%	0.00%	0.00%
1709000302	1.14%	97.57%	1.30%	0.00%	0.00%
1709000303	7.96%	92.01%	0.03%	0.00%	0.00%
1709000304	0.00%	100.00%	0.00%	0.00%	0.00%

Upper Willamette River chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1709000305	9.59%	85.33%	5.08%	0.00%	0.00%
1709000306	4.54%	88.79%	6.67%	0.00%	0.00%
1709000401	96.61%	3.39%	0.00%	0.00%	0.00%
1709000402	98.33%	1.67%	0.00%	0.00%	0.00%
1709000403	96.23%	2.75%	0.00%	0.00%	0.00%
1709000404	90.11%	9.78%	0.11%	0.00%	0.00%
1709000405	46.21%	53.64%	0.15%	0.00%	0.00%
1709000406	23.54%	76.46%	0.00%	0.00%	0.00%
1709000407	19.71%	79.92%	0.36%	0.00%	0.00%
1709000504	11.88%	87.35%	0.76%	0.00%	0.00%
1709000505	68.07%	31.87%	0.05%	0.00%	0.00%
1709000506	1.39%	98.56%	0.04%	0.00%	0.00%
1709000601	3.59%	96.41%	0.00%	0.00%	0.00%
1709000602	17.52%	82.48%	0.00%	0.00%	0.00%
1709000603	14.37%	85.63%	0.00%	0.00%	0.00%
1709000606	66.79%	33.21%	0.00%	0.00%	0.00%
1709000607	1.23%	98.77%	0.00%	0.00%	0.00%
1709000608	7.57%	92.43%	0.00%	0.00%	0.00%
1709000701	0.50%	99.45%	0.04%	0.00%	0.00%
1709000702	7.64%	92.24%	0.02%	0.10%	0.00%
1709000703	0.01%	97.94%	2.01%	0.00%	0.00%
1709000704	0.32%	99.68%	0.00%	0.00%	0.00%
1709000804	1.96%	98.04%	0.00%	0.00%	0.00%
1709000805	0.45%	99.55%	0.00%	0.00%	0.00%
1709000806	11.00%	88.16%	0.84%	0.00%	0.00%
1709000807	0.00%	99.82%	0.18%	0.00%	0.00%
1709000901	1.22%	94.35%	4.43%	0.00%	0.00%
1709000902	5.42%	94.58%	0.00%	0.00%	0.00%
1709000903	2.57%	97.43%	0.00%	0.00%	0.00%
1709000904	0.00%	100.00%	0.00%	0.00%	0.00%
1709000905	28.94%	71.03%	0.03%	0.00%	0.00%
1709000906	4.04%	95.96%	0.00%	0.00%	0.00%
1709001101	99.97%	0.03%	0.00%	0.00%	0.00%
1709001102	93.98%	0.15%	0.00%	5.83%	0.04%
1709001103	85.90%	0.00%	0.00%	12.63%	0.00%
1709001104	93.65%	6.35%	0.00%	0.00%	0.00%
1709001105	37.03%	62.82%	0.15%	0.00%	0.00%
1709001106	5.70%	94.30%	0.00%	0.00%	0.00%
1709001201	0.00%	100.00%	0.00%	0.00%	0.00%
1709001203	0.00%	99.30%	0.00%	0.00%	0.70%

Upper Columbia River spring-run chinook salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1702000505	15.79%	73.78%	9.83%	0.59%	0.01%
1702000801	99.89%	0.11%	0.00%	0.00%	0.00%
1702000802	98.18%	1.82%	0.00%	0.00%	0.00%
1702000803	100.00%	0.00%	0.00%	0.00%	0.00%
1702000804	89.57%	7.77%	2.65%	0.00%	0.00%
1702000805	93.02%	4.62%	2.37%	0.00%	0.00%
1702000806	66.44%	25.48%	8.08%	0.00%	0.00%
1702000807	67.37%	19.71%	12.91%	0.00%	0.00%
1702001001	85.15%	12.00%	2.85%	0.00%	0.00%
1702001002	16.52%	71.36%	12.12%	0.00%	0.00%
1702001003	5.95%	42.21%	51.83%	0.00%	0.00%
1702001004	18.09%	51.94%	29.97%	0.00%	0.00%
1702001101	95.61%	4.24%	0.15%	0.00%	0.00%
1702001102	96.37%	3.10%	0.53%	0.00%	0.00%
1702001103	79.97%	19.40%	0.63%	0.00%	0.00%
1702001104	81.61%	16.75%	1.64%	0.00%	0.00%
1702001105	56.74%	40.02%	3.24%	0.00%	0.00%
1702001604	76.60%	20.13%	3.27%	0.00%	0.00%
1702001605	86.47%	12.85%	0.68%	0.00%	0.00%
1702001606	48.14%	50.06%	1.79%	0.00%	0.00%
1707010101	1.26%	92.42%	6.32%	0.00%	0.00%
1707010102	3.81%	93.94%	2.25%	0.00%	0.00%
1707010106	21.94%	77.81%	0.22%	0.00%	0.03%
1707010109	19.21%	77.68%	3.10%	0.00%	0.00%
1707010114	2.72%	95.74%	1.47%	0.08%	0.00%
1707010501	0.95%	98.21%	0.51%	0.00%	0.32%
1707010504	13.93%	81.58%	2.28%	0.46%	1.75%
1707010512	25.79%	63.35%	10.09%	0.17%	0.59%
1707010513	54.61%	25.35%	19.92%	0.00%	0.12%
1708000107	39.99%	39.78%	15.66%	0.00%	4.56%

Oregon Coast coho salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1710020101	0.96%	87.23%	7.53%	0.00%	4.28%
1710020201	3.20%	72.75%	24.05%	0.00%	0.00%
1710020202	0.00%	76.72%	23.28%	0.00%	0.00%
1710020203	0.07%	52.53%	47.39%	0.00%	0.00%

Oregon Coast coho salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1710020204	0.00%	41.24%	58.76%	0.00%	0.00%
1710020205	0.00%	65.65%	34.35%	0.00%	0.00%
1710020206	0.02%	32.78%	65.14%	0.00%	2.06%
1710020301	49.79%	46.57%	2.93%	0.00%	0.72%
1710020302	64.62%	29.34%	5.91%	0.01%	0.13%
1710020303	3.04%	87.36%	9.43%	0.00%	0.17%
1710020304	8.07%	33.87%	58.04%	0.00%	0.02%
1710020305	2.80%	17.50%	79.70%	0.00%	0.00%
1710020306	7.07%	9.15%	83.79%	0.00%	0.00%
1710020307	0.00%	39.84%	60.16%	0.00%	0.00%
1710020308	0.43%	72.68%	14.76%	0.00%	12.14%
1710020309	31.00%	57.95%	2.40%	0.00%	8.65%
1710020401	0.79%	81.48%	16.93%	0.47%	0.33%
1710020402	33.15%	51.26%	15.59%	0.00%	0.00%
1710020403	7.49%	84.68%	0.38%	0.00%	7.15%
1710020405	0.04%	95.38%	0.41%	3.72%	0.45%
1710020406	5.34%	66.25%	25.91%	1.56%	0.95%
1710020407	21.18%	76.78%	0.90%	0.75%	0.39%
1710020408	25.39%	71.95%	1.95%	0.00%	0.71%
1710020409	4.91%	86.32%	1.18%	0.00%	7.60%
1710020501	54.18%	45.82%	0.00%	0.00%	0.00%
1710020502	80.69%	19.31%	0.00%	0.00%	0.00%
1710020503	66.91%	32.33%	0.75%	0.00%	0.00%
1710020504	56.16%	42.22%	0.27%	0.00%	1.10%
1710020505	33.33%	62.57%	2.18%	0.00%	1.92%
1710020506	72.99%	26.72%	0.26%	0.00%	0.03%
1710020507	78.61%	17.85%	3.05%	0.00%	0.49%
1710020508	67.51%	31.71%	0.00%	0.00%	0.78%
1710020601	44.11%	55.89%	0.00%	0.00%	0.00%
1710020602	44.06%	55.94%	0.00%	0.00%	0.00%
1710020603	40.38%	59.62%	0.00%	0.00%	0.00%
1710020604	46.11%	53.83%	0.06%	0.00%	0.00%
1710020605	80.90%	19.10%	0.00%	0.00%	0.00%
1710020606	82.53%	17.47%	0.00%	0.00%	0.00%
1710020607	75.58%	22.68%	0.00%	0.11%	1.62%
1710020608	44.23%	52.63%	0.57%	0.04%	2.54%
1710020701	40.56%	57.09%	0.60%	0.00%	1.76%
1710030106	100.00%	0.00%	0.00%	0.00%	0.00%
1710030107	90.02%	9.98%	0.00%	0.00%	0.00%
1710030108	98.39%	1.61%	0.00%	0.00%	0.00%

Oregon Coast coho salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1710030109	76.45%	23.55%	0.00%	0.00%	0.00%
1710030110	45.30%	54.70%	0.00%	0.00%	0.00%
1710030111	62.75%	37.25%	0.00%	0.00%	0.00%
1710030112	5.53%	94.47%	0.00%	0.00%	0.00%
1710030201	99.85%	0.15%	0.00%	0.00%	0.00%
1710030202	93.96%	6.04%	0.00%	0.00%	0.00%
1710030203	87.42%	12.58%	0.00%	0.00%	0.00%
1710030204	61.91%	38.09%	0.00%	0.00%	0.00%
1710030205	42.67%	57.06%	0.10%	0.16%	0.00%
1710030207	40.36%	53.00%	6.64%	0.00%	0.00%
1710030208	53.57%	45.33%	1.10%	0.00%	0.00%
1710030209	39.22%	60.56%	0.19%	0.03%	0.00%
1710030210	12.81%	86.35%	0.19%	0.65%	0.00%
1710030211	40.86%	59.14%	0.00%	0.00%	0.00%
1710030212	26.38%	73.51%	0.12%	0.00%	0.00%
1710030213	3.73%	96.27%	0.00%	0.01%	0.00%
1710030301	34.69%	65.13%	0.18%	0.00%	0.00%
1710030302	7.74%	92.22%	0.04%	0.00%	0.00%
1710030303	24.33%	75.46%	0.20%	0.00%	0.00%
1710030304	36.11%	62.73%	1.16%	0.00%	0.00%
1710030305	29.01%	61.48%	9.50%	0.00%	0.00%
1710030306	59.36%	40.59%	0.05%	0.00%	0.00%
1710030307	57.70%	41.31%	0.62%	0.00%	0.37%
1710030308	21.75%	38.08%	25.68%	0.00%	14.50%
1710030401	21.18%	78.76%	0.05%	0.00%	0.00%
1710030402	0.00%	66.13%	33.87%	0.00%	0.00%
1710030403	13.59%	54.16%	32.19%	0.00%	0.05%
1710030404	7.68%	84.84%	3.63%	0.62%	3.23%
1710030501	61.89%	37.91%	0.00%	0.19%	0.00%
1710030502	31.04%	67.01%	0.09%	1.86%	0.00%
1710030503	7.08%	92.45%	0.05%	0.42%	0.00%
1710030504	53.24%	45.16%	0.00%	1.60%	0.00%
1710030505	36.98%	62.34%	0.68%	0.00%	0.00%
1710030506	2.42%	96.25%	1.29%	0.00%	0.04%
1710030603	28.25%	70.97%	0.69%	0.01%	0.08%
1710030604	3.84%	92.95%	2.59%	0.01%	0.61%

Hood Canal Summer-run chum salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1711001701	67.52%	27.80%	2.47%	2.20%	0.00%
1711001802	20.43%	32.71%	43.62%	2.94%	0.29%
1711001803	85.10%	4.85%	10.05%	0.00%	0.00%
1711001804	88.32%	9.42%	2.21%	0.00%	0.05%
1711001805	92.48%	7.08%	0.44%	0.00%	0.00%
1711001806	88.52%	6.27%	5.20%	0.00%	0.01%
1711001807	18.96%	63.26%	14.35%	0.00%	3.43%
1711001808	3.33%	68.51%	27.34%	0.80%	0.02%
1711001908	3.13%	82.08%	7.27%	0.00%	7.51%
1711002001	15.36%	65.31%	18.00%	0.00%	1.33%
1711002002	26.76%	48.37%	23.82%	0.07%	0.97%
1711002003	75.28%	20.33%	3.84%	0.00%	0.55%
N15	1.61%	93.26%	1.98%	2.03%	1.12%
N16	0.00%	98.60%	0.00%	0.00%	1.40%
N17	0.00%	58.27%	1.65%	22.16%	17.92%
N18	3.24%	38.96%	2.75%	0.10%	54.95%
N19	12.75%	5.39%	0.50%	4.14%	77.22%

Columbia River chum salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1707010509	47.79%	33.92%	18.17%	0.11%	0.02%
1707010512	25.79%	63.35%	10.09%	0.17%	0.59%
1707010513	54.61%	25.35%	19.92%	0.00%	0.12%
1708000106	7.62%	61.96%	30.40%	0.00%	0.01%
1708000107	39.99%	39.78%	15.66%	0.00%	4.56%
1708000109	1.77%	93.07%	5.15%	0.00%	0.01%
1708000205	20.30%	63.80%	15.89%	0.00%	0.00%
1708000206	17.37%	69.86%	12.76%	0.00%	0.00%
1708000301	8.00%	87.00%	4.99%	0.00%	0.00%
1708000304	0.10%	82.29%	17.61%	0.00%	0.00%
1708000305	2.19%	74.71%	23.09%	0.00%	0.01%
1708000503	0.00%	94.06%	5.94%	0.00%	0.00%
1708000504	46.61%	35.97%	17.42%	0.00%	0.00%
1708000505	22.90%	74.09%	3.01%	0.00%	0.00%
1708000506	10.31%	62.12%	27.57%	0.00%	0.00%
1708000507	0.07%	95.06%	4.88%	0.00%	0.00%
1708000508	0.00%	99.08%	0.92%	0.00%	0.00%

Columbia River chum salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1708000602	0.00%	72.26%	25.35%	0.00%	2.39%
1708000603	0.00%	89.36%	10.64%	0.00%	0.00%

Ozette Lake sockeye salmon ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1710010102	18.91%	71.82%	7.04%	1.18%	1.05%

Upper Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1702000503	0.98%	81.08%	17.94%	0.00%	0.00%
1702000504	1.76%	31.96%	6.29%	59.68%	0.31%
1702000505	15.79%	73.78%	9.83%	0.59%	0.01%
1702000601	18.96%	76.40%	4.27%	0.00%	0.37%
1702000602	19.28%	69.32%	9.14%	2.21%	0.04%
1702000603	61.69%	24.46%	13.85%	0.00%	0.00%
1702000604	1.69%	25.84%	10.07%	62.40%	0.01%
1702000605	3.26%	26.07%	27.65%	43.01%	0.01%
1702000704	37.55%	41.07%	18.06%	0.00%	3.32%
1702000801	99.89%	0.11%	0.00%	0.00%	0.00%
1702000802	98.18%	1.82%	0.00%	0.00%	0.00%
1702000803	100.00%	0.00%	0.00%	0.00%	0.00%
1702000804	89.57%	7.77%	2.65%	0.00%	0.00%
1702000805	93.02%	4.62%	2.37%	0.00%	0.00%
1702000806	66.44%	25.48%	8.08%	0.00%	0.00%
1702000807	67.37%	19.71%	12.91%	0.00%	0.00%
1702000903	62.28%	35.77%	1.86%	0.00%	0.09%
1702001001	85.15%	12.00%	2.85%	0.00%	0.00%
1702001002	16.52%	71.36%	12.12%	0.00%	0.00%
1702001003	5.95%	42.21%	51.83%	0.00%	0.00%
1702001004	18.09%	51.94%	29.97%	0.00%	0.00%
1702001101	95.61%	4.24%	0.15%	0.00%	0.00%
1702001102	96.37%	3.10%	0.53%	0.00%	0.00%
1702001103	79.97%	19.40%	0.63%	0.00%	0.00%

Upper Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1702001104	81.61%	16.75%	1.64%	0.00%	0.00%
1702001105	56.74%	40.02%	3.24%	0.00%	0.00%
1702001204	8.68%	70.57%	20.75%	0.00%	0.00%
1702001509	36.97%	54.07%	8.95%	0.00%	0.00%
1702001604	76.60%	20.13%	3.27%	0.00%	0.00%
1702001605	86.47%	12.85%	0.68%	0.00%	0.00%
1702001606	48.14%	50.06%	1.79%	0.00%	0.00%
1707010101	1.26%	92.42%	6.32%	0.00%	0.00%
1707010102	3.81%	93.94%	2.25%	0.00%	0.00%
1707010106	21.94%	77.81%	0.22%	0.00%	0.03%
1707010109	19.21%	77.68%	3.10%	0.00%	0.00%
1707010114	2.72%	95.74%	1.47%	0.08%	0.00%
1707010501	0.95%	98.21%	0.51%	0.00%	0.32%
1707010504	13.93%	81.58%	2.28%	0.46%	1.75%
1707010512	25.79%	63.35%	10.09%	0.17%	0.59%
1707010513	54.61%	25.35%	19.92%	0.00%	0.12%
1708000107	39.99%	39.78%	15.66%	0.00%	4.56%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1702001606	48.14%	50.06%	1.79%	0.00%	0.00%
1706010101	98.37%	1.24%	0.00%	0.00%	0.00%
1706010102	80.88%	17.83%	1.24%	0.00%	0.00%
1706010104	38.30%	54.82%	6.88%	0.00%	0.00%
1706010201	99.93%	0.07%	0.00%	0.00%	0.00%
1706010202	84.21%	15.79%	0.00%	0.00%	0.00%
1706010203	80.66%	19.34%	0.00%	0.00%	0.00%
1706010204	23.61%	76.36%	0.03%	0.00%	0.00%
1706010205	81.65%	18.25%	0.09%	0.00%	0.00%
1706010301	54.05%	41.14%	4.81%	0.00%	0.00%
1706010302	30.46%	61.78%	7.75%	0.00%	0.00%
1706010303	2.65%	84.41%	12.74%	0.13%	0.00%
1706010401	87.48%	12.52%	0.00%	0.00%	0.00%
1706010402	72.72%	24.05%	0.11%	2.91%	0.21%
1706010403	48.72%	51.21%	0.07%	0.00%	0.00%
1706010404	43.18%	56.72%	0.10%	0.00%	0.00%
1706010405	54.51%	45.31%	0.18%	0.00%	0.00%
1706010406	7.99%	90.88%	1.13%	0.00%	0.00%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1706010407	11.24%	88.76%	0.00%	0.00%	0.00%
1706010408	24.88%	74.57%	0.55%	0.00%	0.00%
1706010409	27.06%	72.78%	0.16%	0.00%	0.00%
1706010410	77.67%	22.33%	0.00%	0.00%	0.00%
1706010411	22.90%	77.10%	0.00%	0.00%	0.00%
1706010501	35.68%	64.23%	0.10%	0.00%	0.00%
1706010502	75.39%	23.34%	1.27%	0.00%	0.00%
1706010503	1.01%	98.96%	0.04%	0.00%	0.00%
1706010504	79.25%	20.41%	0.33%	0.00%	0.00%
1706010505	89.76%	10.24%	0.00%	0.00%	0.00%
1706010506	8.92%	91.08%	0.00%	0.00%	0.00%
1706010601	46.35%	53.61%	0.04%	0.00%	0.00%
1706010602	37.75%	61.81%	0.45%	0.00%	0.00%
1706010603	96.73%	3.27%	0.00%	0.00%	0.00%
1706010604	52.06%	47.94%	0.00%	0.00%	0.00%
1706010605	44.80%	55.20%	0.00%	0.00%	0.00%
1706010606	56.26%	38.17%	5.57%	0.00%	0.00%
1706010607	19.57%	77.13%	3.29%	0.00%	0.00%
1706010701	0.31%	96.41%	3.27%	0.00%	0.00%
1706010702	0.51%	96.88%	2.60%	0.00%	0.00%
1706010703	0.00%	96.63%	3.37%	0.00%	0.00%
1706010704	0.04%	98.56%	1.40%	0.00%	0.00%
1706010705	7.50%	89.93%	2.58%	0.00%	0.00%
1706010706	48.62%	41.83%	9.55%	0.00%	0.00%
1706010707	0.00%	96.00%	4.00%	0.00%	0.00%
1706010708	0.25%	97.00%	2.74%	0.00%	0.00%
1706010808	0.67%	87.24%	12.08%	0.00%	0.00%
1706011001	0.76%	94.43%	4.81%	0.00%	0.00%
1706011003	0.90%	94.94%	4.16%	0.00%	0.00%
1706011004	24.58%	70.63%	4.79%	0.00%	0.00%
1706020101	76.63%	19.80%	3.43%	0.00%	0.00%
1706020104	88.37%	6.19%	4.82%	0.00%	0.00%
1706020105	91.46%	4.78%	3.63%	0.00%	0.00%
1706020107	93.84%	0.76%	5.40%	0.00%	0.00%
1706020108	96.32%	0.63%	3.03%	0.00%	0.00%
1706020109	90.43%	5.24%	3.62%	0.00%	0.00%
1706020110	99.72%	0.28%	0.00%	0.00%	0.00%
1706020111	99.48%	0.31%	0.00%	0.00%	0.00%
1706020112	93.29%	3.00%	3.46%	0.00%	0.00%
1706020113	97.32%	2.43%	0.00%	0.00%	0.00%
1706020114	99.82%	0.13%	0.00%	0.00%	0.00%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1706020115	95.15%	3.34%	1.05%	0.00%	0.00%
1706020117	88.38%	10.23%	1.38%	0.00%	0.00%
1706020118	92.43%	5.19%	1.82%	0.00%	0.00%
1706020119	85.68%	14.05%	0.28%	0.00%	0.00%
1706020120	93.95%	2.05%	0.30%	0.00%	0.00%
1706020121	93.37%	0.24%	0.00%	0.00%	0.00%
1706020122	86.32%	13.05%	0.00%	0.00%	0.00%
1706020123	97.94%	1.68%	0.00%	0.00%	0.00%
1706020124	100.00%	0.00%	0.00%	0.00%	0.00%
1706020125	97.99%	2.01%	0.00%	0.00%	0.00%
1706020126	99.74%	0.26%	0.00%	0.00%	0.00%
1706020127	100.00%	0.00%	0.00%	0.00%	0.00%
1706020128	96.51%	2.61%	0.88%	0.00%	0.00%
1706020129	83.79%	16.16%	0.00%	0.00%	0.00%
1706020130	94.12%	4.42%	1.46%	0.00%	0.00%
1706020132	97.07%	1.99%	0.94%	0.00%	0.00%
1706020201	78.21%	19.12%	2.64%	0.00%	0.00%
1706020202	88.80%	8.67%	2.52%	0.00%	0.00%
1706020203	84.59%	12.38%	2.94%	0.00%	0.00%
1706020301	99.15%	0.80%	0.00%	0.00%	0.00%
1706020302	99.71%	0.29%	0.00%	0.00%	0.00%
1706020303	98.50%	1.34%	0.00%	0.00%	0.16%
1706020304	97.80%	2.08%	0.00%	0.00%	0.12%
1706020305	93.83%	5.60%	0.00%	0.00%	0.01%
1706020306	96.00%	3.94%	0.00%	0.00%	0.05%
1706020307	80.80%	16.96%	1.67%	0.00%	0.00%
1706020308	80.27%	18.83%	0.88%	0.00%	0.02%
1706020309	71.23%	25.94%	2.12%	0.00%	0.00%
1706020310	87.00%	11.85%	0.83%	0.00%	0.00%
1706020311	90.51%	7.52%	1.22%	0.00%	0.00%
1706020312	92.01%	6.01%	1.62%	0.00%	0.00%
1706020313	94.15%	3.48%	2.37%	0.00%	0.00%
1706020314	96.65%	2.47%	0.88%	0.00%	0.00%
1706020315	97.63%	2.37%	0.00%	0.00%	0.00%
1706020316	99.51%	0.49%	0.00%	0.00%	0.00%
1706020317	98.71%	1.29%	0.00%	0.00%	0.00%
1706020318	99.63%	0.37%	0.00%	0.00%	0.00%
1706020319	96.66%	3.34%	0.00%	0.00%	0.00%
1706020320	98.29%	1.71%	0.00%	0.00%	0.00%
1706020321	99.33%	0.54%	0.00%	0.00%	0.00%
1706020322	99.00%	1.00%	0.00%	0.00%	0.00%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1706020323	99.90%	0.04%	0.00%	0.00%	0.00%
1706020401	55.41%	39.91%	4.65%	0.00%	0.03%
1706020402	72.17%	21.03%	6.79%	0.00%	0.01%
1706020403	84.82%	11.80%	3.28%	0.00%	0.10%
1706020404	85.57%	11.84%	2.51%	0.00%	0.08%
1706020405	84.82%	11.93%	3.25%	0.00%	0.00%
1706020406	69.77%	27.04%	3.19%	0.00%	0.01%
1706020407	67.28%	26.78%	5.80%	0.00%	0.00%
1706020408	73.45%	24.83%	1.69%	0.00%	0.00%
1706020409	90.38%	7.80%	1.81%	0.00%	0.01%
1706020414	90.15%	8.42%	1.35%	0.00%	0.00%
1706020501	99.28%	0.72%	0.00%	0.00%	0.00%
1706020502	100.00%	0.00%	0.00%	0.00%	0.00%
1706020503	99.88%	0.12%	0.00%	0.00%	0.00%
1706020504	100.00%	0.00%	0.00%	0.00%	0.00%
1706020505	99.57%	0.37%	0.00%	0.00%	0.00%
1706020506	99.51%	0.35%	0.00%	0.00%	0.00%
1706020507	99.60%	0.35%	0.00%	0.00%	0.00%
1706020508	99.27%	0.71%	0.00%	0.00%	0.00%
1706020509	97.29%	0.77%	1.94%	0.00%	0.00%
1706020510	99.95%	0.00%	0.00%	0.00%	0.00%
1706020511	99.98%	0.02%	0.00%	0.00%	0.00%
1706020512	99.02%	0.13%	0.85%	0.00%	0.00%
1706020513	96.99%	0.83%	2.18%	0.00%	0.00%
1706020601	99.84%	0.00%	0.00%	0.00%	0.00%
1706020602	99.82%	0.00%	0.00%	0.00%	0.00%
1706020603	97.99%	0.91%	1.10%	0.00%	0.00%
1706020604	99.26%	0.74%	0.00%	0.00%	0.00%
1706020605	98.63%	1.37%	0.00%	0.00%	0.00%
1706020606	99.63%	0.37%	0.00%	0.00%	0.00%
1706020607	100.00%	0.00%	0.00%	0.00%	0.00%
1706020608	99.67%	0.33%	0.00%	0.00%	0.00%
1706020609	99.70%	0.30%	0.00%	0.00%	0.00%
1706020610	99.98%	0.02%	0.00%	0.00%	0.00%
1706020611	98.62%	1.29%	0.00%	0.00%	0.00%
1706020612	100.00%	0.00%	0.00%	0.00%	0.00%
1706020613	95.29%	1.86%	2.81%	0.00%	0.00%
1706020614	100.00%	0.00%	0.00%	0.00%	0.00%
1706020615	100.00%	0.00%	0.00%	0.00%	0.00%
1706020616	98.59%	0.40%	1.01%	0.00%	0.00%
1706020617	99.88%	0.12%	0.00%	0.00%	0.00%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1706020701	98.44%	1.11%	0.36%	0.00%	0.00%
1706020702	99.43%	0.57%	0.00%	0.00%	0.00%
1706020703	98.68%	0.52%	0.80%	0.00%	0.00%
1706020704	98.23%	1.75%	0.00%	0.00%	0.00%
1706020705	97.88%	1.96%	0.00%	0.00%	0.00%
1706020706	99.37%	0.63%	0.00%	0.00%	0.00%
1706020707	98.61%	1.39%	0.00%	0.00%	0.00%
1706020708	99.29%	0.71%	0.00%	0.00%	0.00%
1706020709	99.96%	0.00%	0.00%	0.00%	0.00%
1706020710	99.85%	0.15%	0.00%	0.00%	0.00%
1706020711	99.89%	0.00%	0.00%	0.00%	0.00%
1706020712	99.59%	0.00%	0.00%	0.00%	0.00%
1706020713	99.96%	0.00%	0.00%	0.00%	0.00%
1706020714	99.84%	0.08%	0.00%	0.00%	0.07%
1706020715	99.75%	0.00%	0.00%	0.00%	0.00%
1706020716	99.89%	0.00%	0.00%	0.00%	0.00%
1706020717	99.75%	0.25%	0.00%	0.00%	0.00%
1706020718	99.48%	0.42%	0.00%	0.00%	0.00%
1706020719	97.85%	2.15%	0.00%	0.00%	0.00%
1706020801	98.95%	1.03%	0.01%	0.00%	0.00%
1706020802	95.04%	1.35%	3.62%	0.00%	0.00%
1706020803	99.45%	0.23%	0.32%	0.00%	0.00%
1706020804	95.29%	2.50%	2.19%	0.00%	0.00%
1706020805	96.29%	1.04%	2.51%	0.00%	0.00%
1706020806	100.00%	0.00%	0.00%	0.00%	0.00%
1706020807	100.00%	0.00%	0.00%	0.00%	0.00%
1706020808	99.97%	0.00%	0.00%	0.00%	0.00%
1706020809	98.66%	0.43%	0.00%	0.00%	0.00%
1706020810	98.69%	0.29%	0.94%	0.00%	0.00%
1706020811	99.58%	0.00%	0.00%	0.00%	0.00%
1706020812	99.82%	0.05%	0.00%	0.00%	0.00%
1706020813	98.74%	0.06%	0.87%	0.00%	0.00%
1706020814	98.84%	1.16%	0.00%	0.00%	0.00%
1706020815	95.22%	0.69%	4.09%	0.00%	0.00%
1706020901	18.90%	74.57%	6.52%	0.00%	0.00%
1706020902	12.57%	70.52%	16.91%	0.00%	0.00%
1706020903	3.93%	92.41%	3.66%	0.00%	0.00%
1706020904	12.26%	81.56%	5.87%	0.00%	0.00%
1706020905	15.72%	78.58%	5.42%	0.00%	0.00%
1706020906	0.24%	97.35%	2.34%	0.00%	0.00%
1706020907	16.67%	80.14%	1.79%	0.00%	0.00%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1706020908	56.96%	28.81%	14.23%	0.00%	0.00%
1706020909	27.93%	67.41%	3.66%	0.00%	0.00%
1706020910	68.11%	31.89%	0.00%	0.00%	0.00%
1706020911	94.64%	5.34%	0.02%	0.00%	0.00%
1706020912	56.99%	38.51%	3.94%	0.00%	0.00%
1706020913	73.53%	19.42%	6.29%	0.00%	0.00%
1706020914	91.45%	7.47%	0.00%	0.00%	0.00%
1706020915	94.28%	2.36%	3.36%	0.00%	0.00%
1706020916	90.59%	5.26%	4.15%	0.00%	0.00%
1706020917	2.79%	80.58%	16.63%	0.00%	0.00%
1706021001	48.39%	39.22%	12.37%	0.00%	0.00%
1706021002	69.63%	26.92%	2.65%	0.00%	0.00%
1706021003	96.54%	1.09%	1.24%	0.00%	0.00%
1706021006	94.72%	3.19%	2.09%	0.00%	0.00%
1706021007	93.24%	5.97%	0.67%	0.00%	0.00%
1706030101	99.93%	0.00%	0.00%	0.00%	0.00%
1706030102	99.95%	0.00%	0.00%	0.00%	0.05%
1706030103	99.86%	0.05%	0.00%	0.00%	0.00%
1706030104	99.94%	0.00%	0.00%	0.00%	0.06%
1706030105	99.96%	0.00%	0.00%	0.00%	0.04%
1706030106	99.98%	0.00%	0.00%	0.00%	0.02%
1706030107	100.00%	0.00%	0.00%	0.00%	0.00%
1706030108	99.93%	0.03%	0.00%	0.00%	0.00%
1706030109	100.00%	0.00%	0.00%	0.00%	0.00%
1706030201	99.08%	0.00%	0.33%	0.00%	0.00%
1706030202	99.96%	0.00%	0.00%	0.00%	0.00%
1706030203	100.00%	0.00%	0.00%	0.00%	0.00%
1706030204	99.75%	0.00%	0.00%	0.00%	0.00%
1706030205	99.63%	0.00%	0.00%	0.00%	0.00%
1706030207	100.00%	0.00%	0.00%	0.00%	0.00%
1706030208	99.78%	0.22%	0.00%	0.00%	0.00%
1706030209	99.95%	0.00%	0.00%	0.00%	0.05%
1706030210	100.00%	0.00%	0.00%	0.00%	0.00%
1706030211	100.00%	0.00%	0.00%	0.00%	0.00%
1706030212	100.00%	0.00%	0.00%	0.00%	0.00%
1706030213	100.00%	0.00%	0.00%	0.00%	0.00%
1706030214	100.00%	0.00%	0.00%	0.00%	0.00%
1706030301	99.74%	0.00%	0.05%	0.00%	0.00%
1706030302	100.00%	0.00%	0.00%	0.00%	0.00%
1706030303	100.00%	0.00%	0.00%	0.00%	0.00%
1706030304	93.91%	6.09%	0.00%	0.00%	0.00%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1706030305	49.90%	50.10%	0.00%	0.00%	0.00%
1706030306	88.14%	11.80%	0.00%	0.00%	0.06%
1706030307	58.42%	41.35%	0.00%	0.00%	0.05%
1706030308	88.75%	11.25%	0.00%	0.00%	0.00%
1706030309	99.82%	0.00%	0.00%	0.00%	0.08%
1706030310	99.90%	0.00%	0.00%	0.00%	0.10%
1706030311	100.00%	0.00%	0.00%	0.00%	0.00%
1706030312	100.00%	0.00%	0.00%	0.00%	0.00%
1706030313	100.00%	0.00%	0.00%	0.00%	0.00%
1706030314	100.00%	0.00%	0.00%	0.00%	0.00%
1706030401	36.28%	31.02%	21.16%	10.28%	0.00%
1706030402	65.36%	27.15%	2.21%	5.28%	0.00%
1706030501	38.57%	38.35%	2.03%	20.97%	0.00%
1706030502	95.38%	4.62%	0.00%	0.00%	0.00%
1706030503	99.52%	0.48%	0.00%	0.00%	0.00%
1706030504	98.47%	1.36%	0.17%	0.00%	0.00%
1706030505	99.30%	0.70%	0.00%	0.00%	0.00%
1706030506	84.00%	12.66%	3.34%	0.00%	0.00%
1706030507	96.72%	2.93%	0.34%	0.00%	0.00%
1706030508	98.65%	1.33%	0.00%	0.00%	0.00%
1706030509	99.93%	0.00%	0.00%	0.00%	0.00%
1706030510	99.21%	0.68%	0.00%	0.00%	0.00%
1706030511	97.17%	2.83%	0.00%	0.00%	0.00%
1706030512	0.10%	70.89%	0.00%	29.01%	0.00%
1706030513	0.02%	53.79%	0.00%	46.19%	0.00%
1706030601	0.00%	63.73%	0.00%	33.12%	0.56%
1706030602	0.16%	62.54%	0.00%	36.71%	0.05%
1706030603	0.10%	95.38%	0.00%	4.52%	0.00%
1706030604	0.13%	97.90%	1.86%	0.00%	0.00%
1706030606	0.66%	96.94%	2.39%	0.00%	0.00%
1706030607	41.19%	42.07%	16.73%	0.00%	0.00%
1706030608	0.00%	52.64%	0.13%	46.07%	0.02%
1706030609	0.00%	0.00%	0.00%	98.97%	0.00%
1706030610	0.00%	0.00%	0.00%	100.00%	0.00%
1706030611	0.00%	0.00%	0.00%	100.00%	0.00%
1706030612	0.00%	27.07%	24.23%	47.88%	0.00%
1706030613	12.11%	65.66%	20.94%	1.29%	0.00%
1706030614	1.00%	57.05%	35.59%	6.34%	0.03%
1706030615	5.60%	57.25%	12.75%	24.36%	0.00%
1706030616	47.69%	34.20%	18.11%	0.00%	0.00%
1706030617	41.29%	40.58%	18.12%	0.00%	0.00%

Snake River Basin O. mykiss ESU					
	Ownership Class				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1706030618	100.00%	0.00%	0.00%	0.00%	0.00%
1706030619	100.00%	0.00%	0.00%	0.00%	0.00%
1706030620	0.00%	0.00%	0.00%	98.77%	0.00%
1706030621	0.00%	1.82%	0.00%	97.43%	0.00%
1706030622	1.14%	32.27%	3.28%	62.12%	0.00%
1706030623	0.00%	0.00%	0.00%	100.00%	0.00%
1706030624	0.00%	0.00%	0.00%	100.00%	0.00%
1706030627	0.00%	0.00%	0.00%	100.00%	0.00%
1706030630	0.00%	39.71%	0.00%	60.04%	0.00%
1706030631	0.00%	0.00%	0.00%	100.00%	0.00%
1706030801	5.64%	47.52%	18.65%	18.64%	0.00%
1707010101	1.26%	92.42%	6.32%	0.00%	0.00%
1707010102	3.81%	93.94%	2.25%	0.00%	0.00%
1707010106	21.94%	77.81%	0.22%	0.00%	0.03%
1707010109	19.21%	77.68%	3.10%	0.00%	0.00%
1707010114	2.72%	95.74%	1.47%	0.08%	0.00%
1707010501	0.95%	98.21%	0.51%	0.00%	0.32%
1707010504	13.93%	81.58%	2.28%	0.46%	1.75%
1707010512	25.79%	63.35%	10.09%	0.17%	0.59%
1707010513	54.61%	25.35%	19.92%	0.00%	0.12%
1708000107	39.99%	39.78%	15.66%	0.00%	4.56%

Lower Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1707010506	70.22%	28.85%	0.92%	0.00%	0.00%
1707010507	67.32%	32.23%	0.02%	0.00%	0.00%
1707010508	11.92%	87.96%	0.11%	0.00%	0.00%
1707010511	89.26%	8.22%	2.50%	0.00%	0.02%
1707010512	25.79%	63.35%	10.09%	0.17%	0.59%
1707010513	54.61%	25.35%	19.92%	0.00%	0.12%
1708000101	93.19%	6.70%	0.11%	0.00%	0.00%
1708000102	96.79%	3.21%	0.00%	0.00%	0.00%
1708000103	89.87%	10.13%	0.00%	0.00%	0.00%
1708000104	27.03%	72.97%	0.00%	0.00%	0.00%
1708000105	87.81%	11.69%	0.00%	0.00%	0.00%
1708000106	7.62%	61.96%	30.40%	0.00%	0.01%
1708000107	39.99%	39.78%	15.66%	0.00%	4.56%
1708000108	15.87%	81.04%	1.38%	0.00%	1.71%

Lower Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1708000109	1.77%	93.07%	5.15%	0.00%	0.01%
1708000205	20.30%	63.80%	15.89%	0.00%	0.00%
1708000206	17.37%	69.86%	12.76%	0.00%	0.00%
1708000301	8.00%	87.00%	4.99%	0.00%	0.00%
1708000401	99.91%	0.09%	0.00%	0.00%	0.00%
1708000402	92.49%	6.69%	0.82%	0.00%	0.00%
1708000403	62.11%	36.02%	1.87%	0.00%	0.00%
1708000404	99.91%	0.00%	0.00%	0.06%	0.03%
1708000405	91.38%	8.05%	0.57%	0.00%	0.00%
1708000501	17.69%	74.83%	7.48%	0.00%	0.00%
1708000502	7.02%	85.15%	7.83%	0.00%	0.00%
1708000503	0.00%	94.06%	5.94%	0.00%	0.00%
1708000504	46.61%	35.97%	17.42%	0.00%	0.00%
1708000505	22.90%	74.09%	3.01%	0.00%	0.00%
1708000506	10.31%	62.12%	27.57%	0.00%	0.00%
1708000507	0.07%	95.06%	4.88%	0.00%	0.00%
1708000508	0.00%	99.08%	0.92%	0.00%	0.00%
1709000704	0.32%	99.68%	0.00%	0.00%	0.00%
1709001101	99.97%	0.03%	0.00%	0.00%	0.00%
1709001102	93.98%	0.15%	0.00%	5.83%	0.04%
1709001103	85.90%	0.00%	0.00%	12.63%	0.00%
1709001104	93.65%	6.35%	0.00%	0.00%	0.00%
1709001105	37.03%	62.82%	0.15%	0.00%	0.00%
1709001106	5.70%	94.30%	0.00%	0.00%	0.00%
1709001201	0.00%	100.00%	0.00%	0.00%	0.00%
1709001202	5.23%	85.18%	8.51%	0.00%	1.09%
1709001203	0.00%	99.30%	0.00%	0.00%	0.70%

Upper Willamette O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1709000303	7.96%	92.01%	0.03%	0.00%	0.00%
1709000304	0.00%	100.00%	0.00%	0.00%	0.00%
1709000306	4.54%	88.79%	6.67%	0.00%	0.00%
1709000504	11.88%	87.35%	0.76%	0.00%	0.00%
1709000505	68.07%	31.87%	0.05%	0.00%	0.00%
1709000506	1.39%	98.56%	0.04%	0.00%	0.00%
1709000601	3.59%	96.41%	0.00%	0.00%	0.00%

Upper Willamette O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1709000602	17.52%	82.48%	0.00%	0.00%	0.00%
1709000603	14.37%	85.63%	0.00%	0.00%	0.00%
1709000606	66.79%	33.21%	0.00%	0.00%	0.00%
1709000607	1.23%	98.77%	0.00%	0.00%	0.00%
1709000608	7.57%	92.43%	0.00%	0.00%	0.00%
1709000701	0.50%	99.45%	0.04%	0.00%	0.00%
1709000702	7.64%	92.24%	0.02%	0.10%	0.00%
1709000703	0.01%	97.94%	2.01%	0.00%	0.00%
1709000704	0.32%	99.68%	0.00%	0.00%	0.00%
1709000801	10.16%	79.54%	0.39%	9.91%	0.00%
1709000802	29.67%	65.73%	0.78%	3.83%	0.00%
1709000803	36.40%	63.60%	0.00%	0.00%	0.00%
1709000804	1.96%	98.04%	0.00%	0.00%	0.00%
1709000805	0.45%	99.55%	0.00%	0.00%	0.00%
1709000806	11.00%	88.16%	0.84%	0.00%	0.00%
1709000807	0.00%	99.82%	0.18%	0.00%	0.00%
1709000901	1.22%	94.35%	4.43%	0.00%	0.00%
1709000902	5.42%	94.58%	0.00%	0.00%	0.00%
1709000903	2.57%	97.43%	0.00%	0.00%	0.00%
1709000904	0.00%	100.00%	0.00%	0.00%	0.00%
1709000905	28.94%	71.03%	0.03%	0.00%	0.00%
1709000906	4.04%	95.96%	0.00%	0.00%	0.00%
1709001001	4.45%	94.96%	0.59%	0.00%	0.00%
1709001002	0.00%	77.09%	22.91%	0.00%	0.00%
1709001003	4.53%	84.16%	11.31%	0.00%	0.00%
1709001004	0.25%	99.75%	0.00%	0.00%	0.00%
1709001005	0.00%	100.00%	0.00%	0.00%	0.00%
1709001201	0.00%	100.00%	0.00%	0.00%	0.00%
1709001203	0.00%	99.30%	0.00%	0.00%	0.70%

Middle Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1702001606	48.14%	50.06%	1.79%	0.00%	0.00%
1703000101	57.39%	41.12%	1.50%	0.00%	0.00%
1703000102	39.89%	56.80%	3.30%	0.00%	0.00%
1703000103	21.94%	60.01%	18.05%	0.00%	0.00%
1703000104	38.55%	30.46%	30.99%	0.00%	0.00%

Middle Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1703000201	93.77%	6.23%	0.00%	0.00%	0.00%
1703000202	74.46%	11.40%	14.14%	0.00%	0.00%
1703000203	54.55%	34.18%	11.25%	0.02%	0.00%
1703000301	0.76%	56.66%	22.97%	19.50%	0.11%
1703000302	24.98%	71.23%	3.78%	0.00%	0.00%
1703000303	0.00%	0.00%	0.00%	100.00%	0.00%
1703000304	3.58%	24.51%	1.58%	70.04%	0.29%
1703000305	0.00%	0.05%	0.01%	99.91%	0.03%
1703000306	3.12%	72.33%	4.22%	20.18%	0.15%
1703000307	51.07%	44.69%	4.24%	0.00%	0.00%
1707010101	1.26%	92.42%	6.32%	0.00%	0.00%
1707010102	3.81%	93.94%	2.25%	0.00%	0.00%
1707010105	0.26%	92.95%	6.72%	0.07%	0.00%
1707010106	21.94%	77.81%	0.22%	0.00%	0.03%
1707010109	19.21%	77.68%	3.10%	0.00%	0.00%
1707010110	1.31%	94.10%	4.52%	0.06%	0.00%
1707010111	2.22%	88.82%	8.69%	0.26%	0.01%
1707010112	2.41%	93.92%	3.68%	0.00%	0.00%
1707010113	4.62%	89.28%	6.05%	0.04%	0.01%
1707010114	2.72%	95.74%	1.47%	0.08%	0.00%
1707010201	42.96%	57.04%	0.00%	0.00%	0.00%
1707010202	33.11%	64.22%	2.67%	0.00%	0.00%
1707010203	21.97%	75.00%	3.02%	0.00%	0.00%
1707010204	0.04%	97.47%	2.49%	0.00%	0.00%
1707010207	0.04%	98.72%	1.24%	0.00%	0.00%
1707010208	0.32%	99.16%	0.52%	0.00%	0.00%
1707010209	0.00%	99.96%	0.04%	0.00%	0.00%
1707010210	0.02%	98.34%	1.64%	0.00%	0.00%
1707010211	0.23%	97.00%	2.77%	0.00%	0.00%
1707010301	83.32%	12.71%	0.18%	3.79%	0.00%
1707010302	66.35%	28.88%	0.05%	4.61%	0.11%
1707010303	1.69%	19.81%	0.00%	78.45%	0.05%
1707010304	0.00%	76.30%	0.00%	23.70%	0.00%
1707010305	5.80%	71.17%	0.37%	22.26%	0.40%
1707010306	12.54%	87.25%	0.02%	0.08%	0.11%
1707010307	0.00%	100.00%	0.00%	0.00%	0.00%
1707010308	0.00%	100.00%	0.00%	0.00%	0.00%
1707010310	0.53%	99.47%	0.00%	0.00%	0.00%
1707010313	5.52%	94.15%	0.33%	0.00%	0.00%
1707010501	0.95%	98.21%	0.51%	0.00%	0.32%

Middle Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1707010502	9.45%	90.34%	0.00%	0.22%	0.00%
1707010503	24.06%	75.94%	0.00%	0.00%	0.00%
1707010504	13.93%	81.58%	2.28%	0.46%	1.75%
1707010505	2.84%	96.53%	0.62%	0.00%	0.00%
1707010512	25.79%	63.35%	10.09%	0.17%	0.59%
1707010513	54.61%	25.35%	19.92%	0.00%	0.12%
1707010601	0.05%	0.01%	0.01%	99.89%	0.04%
1707010602	0.01%	0.12%	0.02%	99.81%	0.04%
1707010603	0.07%	92.36%	7.36%	0.17%	0.04%
1707010604	1.48%	84.25%	13.27%	0.84%	0.16%
1707020103	58.09%	41.91%	0.00%	0.00%	0.00%
1707020104	86.92%	13.08%	0.00%	0.00%	0.00%
1707020105	73.72%	25.70%	0.58%	0.00%	0.00%
1707020106	51.13%	48.87%	0.00%	0.00%	0.00%
1707020107	84.97%	15.03%	0.00%	0.00%	0.00%
1707020108	38.54%	61.40%	0.06%	0.00%	0.00%
1707020109	57.96%	41.98%	0.06%	0.00%	0.00%
1707020110	31.36%	68.04%	0.60%	0.00%	0.00%
1707020111	30.92%	68.94%	0.13%	0.00%	0.00%
1707020112	53.65%	45.49%	0.86%	0.00%	0.00%
1707020113	18.54%	81.23%	0.22%	0.00%	0.00%
1707020114	37.09%	62.91%	0.00%	0.00%	0.00%
1707020115	36.99%	62.73%	0.28%	0.00%	0.00%
1707020201	97.47%	2.53%	0.00%	0.00%	0.00%
1707020202	95.35%	4.65%	0.00%	0.00%	0.00%
1707020203	90.67%	9.33%	0.00%	0.00%	0.00%
1707020204	81.96%	18.04%	0.00%	0.00%	0.00%
1707020205	83.22%	16.78%	0.00%	0.00%	0.00%
1707020206	38.01%	61.99%	0.00%	0.00%	0.00%
1707020207	56.90%	42.59%	0.51%	0.00%	0.00%
1707020208	75.33%	24.67%	0.00%	0.00%	0.00%
1707020209	27.42%	72.24%	0.34%	0.00%	0.00%
1707020210	23.31%	76.66%	0.04%	0.00%	0.00%
1707020301	96.95%	3.05%	0.00%	0.00%	0.00%
1707020302	95.36%	4.64%	0.00%	0.00%	0.00%
1707020303	55.65%	43.91%	0.44%	0.00%	0.00%
1707020304	23.34%	76.66%	0.00%	0.00%	0.00%
1707020305	4.34%	95.58%	0.08%	0.00%	0.00%
1707020401	22.98%	75.66%	1.35%	0.00%	0.00%
1707020402	19.55%	80.14%	0.31%	0.00%	0.00%

Middle Columbia River O. mykiss ESU					
	Land Owner (% of Watershed)				
Watershed	Federal	Private/Other	State	Tribal	Unassigned
1707020403	45.80%	54.11%	0.09%	0.00%	0.00%
1707020404	21.05%	78.73%	0.22%	0.00%	0.00%
1707020405	40.45%	59.53%	0.03%	0.00%	0.00%
1707020406	0.28%	99.72%	0.00%	0.00%	0.00%
1707020407	14.30%	85.13%	0.57%	0.00%	0.00%
1707020408	4.17%	95.77%	0.07%	0.00%	0.00%
1707020409	21.30%	78.35%	0.35%	0.00%	0.00%
1707020410	14.23%	84.59%	0.31%	0.87%	0.00%
1707020411	9.00%	90.81%	0.19%	0.00%	0.00%
1707020412	1.70%	98.23%	0.07%	0.00%	0.00%
1707020413	0.62%	99.38%	0.00%	0.00%	0.00%
1707020414	6.38%	89.10%	0.00%	4.52%	0.00%
1707030603	2.27%	20.98%	0.00%	76.75%	0.00%
1707030604	4.09%	0.00%	0.00%	95.90%	0.01%
1707030605	1.21%	0.00%	0.00%	98.77%	0.02%
1707030606	5.71%	0.00%	0.00%	94.29%	0.00%
1707030607	7.34%	60.81%	0.10%	31.71%	0.04%
1707030608	1.83%	98.17%	0.00%	0.00%	0.00%
1707030610	60.42%	37.64%	0.11%	1.64%	0.02%
1707030611	5.13%	94.33%	0.53%	0.00%	0.00%
1707030612	19.38%	80.27%	0.25%	0.09%	0.01%
1707030701	16.65%	83.35%	0.00%	0.00%	0.00%
1707030702	8.24%	91.68%	0.08%	0.00%	0.00%
1707030704	24.87%	75.00%	0.13%	0.00%	0.00%
1707030705	8.03%	91.97%	0.00%	0.00%	0.00%
1708000107	39.99%	39.78%	15.66%	0.00%	4.56%

Appendix D
Estimating Section 7 Impacts and Costs

In this appendix we describe in detail each type of activity (and sub-activity, where applicable) included in the analysis:

- Hydropower dams[1]
- Non-hydropower dams and other water supply structures
- Federal lands management, including grazing (considered separately)
- Transportation projects
- Utility line projects
- Instream activities, including dredging (considered separately)
- EPA NPDES-permitted activities
- Sand & gravel mining
- Residential and commercial development

In each case, we describe the following:

- The nature of the activity;
- Any potential modifications necessary to comply with section 7 for the protection of Pacific salmon and O. mykiss;
- The range of costs associated with those modifications;
- The methods for estimating the occurrence of the activity over space and time; and
- the likelihood that an activity will require modification.

We also consider the assumptions and possible biases for our analysis for each type of activity.

Because our data sources for the cost estimates do not constitute a random sample, we cannot use an average over the range of estimated costs. We therefore assume that the endpoints of the range represent the minimum and maximum values of a symmetric cost distribution, and use the midpoint of the range as the representative cost estimate.

This appendix supports the analysis for both the 13 Pacific Northwest salmon and O. mykiss ESUs as well as the 7 California ESUs. For that reason, the appendix contains references to data and methods specific to California, although the results for the California ESUs are not included in the other parts of this analysis.

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1. The Federal Columbia River Power System (FCRPS) is a system of 31 federally-owned hydropower projects in the Columbia and Snake River basins. The impacts of critical habitat designation and implementation of section 7 of the ESA on the FCRPS are included in this analysis but treated as a separate type of hydropower activity.

Below, we first discuss the method used for obtaining estimates of the annual expected modification cost. We then discuss the application of this method to each activity type. Finally, we present a summary table for all activity types.

D 1. Method for estimating annual expected modification costs

The method we used has the following components:

1) **Modification cost stream**
If a project needs to be modified to comply with section 7, we assume that the expenditures on those modifications begin today (year 0) and extend through year τ. This gives a stream of expenditures or costs, $\{C_0, \ldots, C_\tau\}$. In most cases, we assume $\tau = 0$ – that is, the costs are incurred in a single year. In other cases, costs may consist of capital costs that occur in the first year and O&M costs that occur in subsequent years. In still others, the costs may be capital costs that are spread out over a number of years.

2) **Forecast period for consultation**
This is the period over which we project each type of activity that may need to be modified to comply with section 7. The length of the period, T, is determined by one or both of two factors: the nature of the activity (e.g., FERC-licensed dams) and the nature of the data. In some cases, we used judgment to set this period.

3) **Probability of project modifications during the forecast period**
This probability has two components:

1) The probability, p_t, that consultation will occur in year t, where $0 \le t \le T$.
2) The probability, p_M, that consultation will result in a requirement to modify the project.

We assume that p_M is independent of t, and so the probability of project modifications beginning in year t is $p_M p_t$.

Using these three components, our calculation of the annual expected modification cost proceeds as follows:

Step 1: Calculate the present value of the cost stream
We take the stream of costs, $\{C_i\}$, and calculate its present value, using the discount rate, r :

(1)
$$PV_C = \sum_{i=0}^{\tau} \frac{C_i}{(1+r)^i}$$

PV_C is the estimated present value of costs incurred if modifications are required.

Step 2: Calculate the expected value of costs over the forecast period
We apply the probabilities of consultation and modification in year t to the present value of costs to get the expected value of costs for year t, $EC_t = p_t p_M PV_C$. We then calculate the present value of this expected cost, PV_{EC}, over the forecast period, using the discount rate, r :

(2)
$$PV_{EC} = \sum_{t=0}^{T} \frac{EC_t}{(1+r)^t} = \sum_{t=0}^{T} \frac{p_t p_M PV_E}{(1+r)^t}$$

Step 3: Annualization of PV_{EC}
Because T varies across activities, we express modification costs as an annual expected value, AEV_C, using the standard formula for annualization:

(3)
$$AEV_C = PV_{EC}\left[\frac{r}{1-(1+r)^{-T}}\right]$$

In general, AEV_C depends on the discount rate, r, in a complex way, as r affects both the annualization and the embedded present value of costs, PV_C. If p_t is uniformly distributed throughout the forecast period, however, $p_t = 1/T$. In that case, $p_t p_M PV_C = (p_M PV_C)/T$, which is constant over time. We therefore have

(4)
$$\boldsymbol{AEV_C = p_M PV_C / T.}$$

Moreover, if expenditures occur in a single year, then $PV_C = C_0$, which is independent of the discount rate. In this case, $AEV_C = p_M C_0$ will also be independent of the discount rate.

We use AEV_C to express the cost of section 7 impacts. In Section 5 of the report, we project this annual value over a 20-year period to give a picture of the present value of the costs, but the annual value is the most accurate estimate, given the wide range in forecast periods.

An important assumption embedded in this method is that AEV_C is independent of the area or extent of the critical habitat designation. This is equivalent to assuming that the cumulative impacts of critical habitat designation are minimal. If this assumption is violated, the designation may raise

market prices, which are used to evaluate the costs of the impacts. If this happens, the number (and order) of watersheds designated will affect the assessment of a given watershed's impacts.[2]

This possibility raises a difficult analytical issue. If cumulative impacts are present, the analysis should then conducted either as a series of individual watershed designations with a fixed order, or more generally as a combination of watersheds, ranging over all possibility combinations. Even if data existed on cumulative effects, the possible combinations quickly become intractable .[3]

Although there is no evidence that cumulative impacts are present and significant, we note that the assumption they are absent introduces a potential bias in the results. If the assumption is violated, the estimates we use are biased downward, in that the cumulative impacts would likely increase the cost of critical habitat designation above the levels we estimate.

D 2. Hydropower Dams

D 2.1 Overview

- This analysis assesses impacts to hydropower projects that may result from future section 7 implementation for Pacific salmon and O. mykiss within the proposed critical habitat. Hydropower-related activities include operations, maintenance, construction and deconstruction of hydropower facilities including licensing/relicensing, modifications to infrastructure, changes in operation, and removal of dams. A review of recent consultation history shows that approximately five percent of section 7 consultations in the Northwest Region for Pacific salmon and O. mykiss are conducted on various hydropower-related activities.

- This analysis assigns a per-project cost estimate based on the likely suite of modifications to infrastructure and operations that may be required in order to comply with the Endangered Species Act (ESA) for Pacific salmon and O. mykiss. The primary modifications we analyzed are change to flow regime (either level of flow or timing of flow), construction or improvements to fish passage facilities and programs, research and monitoring of water quality and fish passage efficiency, and offsite mitigation, such as land purchases for the purpose of conservation. While

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2. The problem is akin to identifying the "deciding" vote in an election that is won by a single vote. Any voter can lay claim to being the "deciding" voter, as without that vote the election outcome would have been reversed. Only if votes are cast in a certain, fixed order could this claim be legitimate. Similarly, if market prices rise as designations accumulate, this effect can be attributed to any one of the watersheds being designated. The impact of designating a particular watershed, then, may be significantly different if the designation is the "first" or the "last."

3. The number of possible designations, where each individual watershed cycles between included and excluded, increases exponentially as the number of watersheds increases. For example, the Hood Canal summer-run chum salmon ESU has 17 individual areas under consideration, which produces over 130,000 possible combinations; the Puget Sound chinook salmon ESU, with 80 watersheds, has 1.2×10^{24} possible combinations; and the Snake River Basin O. mykiss ESU, with 287 watersheds, has 2.5×10^{86} possible combinations.

data regarding anticipated costs stemming from changes in flow regime for particular projects are presented, this category of costs is not integrated with the impact assessment due to the uncertainty surrounding the potential magnitude of costs, and the difficulty in attributing these costs to the designation of a particular area as critical habitat.

- Where information is available on the likely project modifications recommended for a particular project, the anticipated costs are assigned to that dam. For all other projects, annualized expected costs of project modification are assigned according to two project attributes: (1) size of project based on level of installed capacity; and (2) status of fish passage provisions. The following are the per-project costs of modifications associated with the various types of hydropower projects:

  - Installed capacity of less than five megawatts (MW): $2.1 million[4] ($24,000 - $4.2 million)
  - Installed capacity between five and 20 MW: $5.76 million ($0 - $11.5 million)
  - Installed capacity of greater than 20 MW; Fish passage provisions may be required: $73.85 million ($11.5 to $136.0 million)
  - Installed capacity of greater than 20 MW; Fish passage provisions are already present: $45.23 million ($11.5 to $79.1 million)
  - Installed capacity unknown: $7.53 million ($0 to $136.0 million)[5]
  - Federal Columbia River Power System (FCRPS) hydropower projects (system-wide cost, not separable on a per-watershed basis): $503,600,000
  - Dam removal costs: $24,000,000[6]

- While costs were estimated for FCRPS projects, cost estimates were not assigned to individual watersheds.

- For FERC-licensed dams, section 7 consultation and subsequent project modification are anticipated to begin concurrent with the expiration of the current FERC license, or, in the absence of that information, we assume consultation will be initiated within the next 30 years based on the fact that FERC licenses typically last 30 to 50 years. This analysis assumes that consultation for each Federal project will occur sometime within the next 10 years. For small projects, we assume consultation has a ten percent chance of occurring at some point over the next 20 years. For the majority of hydropower projects, the costs of project modifications are assumed to be incurred uniformly over a ten year time period beginning in the year of section 7 consultation.

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4. We assume these projects have a ten percent likelihood of bearing these costs due to consultation.

5. The midpoint estimate is estimated by summing the product of the estimated probability that a dam with an unknown capacity could belong to one of the known capacity categories and the midpoint cost estimate for the appropriate capacity category.

6. We do not have a range of costs for dam removals.

D 2.2 Background

Hydropower activities have represented a relatively small percentage of section 7 consultations regarding Pacific salmon and O. mykiss in the past.[7] The consultations that have occurred, however, have at times been controversial and costly. For example, consultation regarding review of the Federal Columbia River Power System (FCRPS) operations occurs on a five year schedule. The 2000 Biological Opinion on the FCRPS has been the subject of litigation challenging the adequacy of the project modification recommendations to provide for Pacific salmon and O. mykiss.[8]

Hydropower activities that generate consultation regarding Pacific salmon and O. mykiss include licensing or relicensing of projects, review of operations plans, construction of new projects, modifications to structures of dams (e.g., installation of fish passage facilities), changes in operations (e.g., change in flow regime), and removal of dams. The major Federal agencies responsible for hydropower activities in the areas under consideration are the Federal Energy Regulatory Commission (FERC), U.S. Army Corps of Engineers (USACE), the U.S. Bureau of Reclamation (USBR) and the Bonneville Power Administration (BPA). FERC issues licenses for privately owned hydropower projects and these licenses are valid for between 30 and 50 years depending on the extent of proposed new development or environmental mitigation and enhancement measures. The USACE and USBR also own and/or operate hydropower projects within the proposed critical habitat for Pacific salmon and O. mykiss. A collaborative group comprised of the BPA, USACE, and USBR oversees operations of the 31 multipurpose dams of the FCRPS. While there is no formal procedure for regular review of Federally-operated projects, any change in operations or existing infrastructure may generate consultation regarding the impact to Pacific salmon and O. mykiss.

Multiple hydropower-related Federal and State regulations provide protection to Pacific salmon and O. mykiss. Specifically, section 10(j) of the Federal Power Act (FPA) was promulgated to ensure that FERC considers both power and non-power resources during the licensing process.[9] Further, section 18 of the FPA states that FERC shall require the construction, operation, and maintenance by a licensee at its own expense of a fishway if prescribed by the Secretaries of Interior (delegated to the FWS) and Commerce (NOAA Fisheries). The Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) also incorporates a Fish and Wildlife Program directing the Pacific Northwest Electric Power and Conservation Planning Council to adopt programs to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River system. BPA resources are utilized through this plan to mitigate and enhance

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7. Within the Northwest region, hydropower projects represent approximately five percent of historical section 7 formal consultations.

8. National Wildlife Fed'n, et al. v. Nat'l Marine Fisheries Serv., et al., 254 F. Supp.2d 1196 (W.D.Wa. 2003) (order finding the no-jeopardy conclusion in the 2000 plan to be arbitrary and capricious).

9. Federal Power Act, 16 U.S.C. § 803(j) (1986).

fish and wildlife and habitat affected by the development and operation of hydroelectric projects in the Columbia River and it tributaries.[10]

Reasonable and prudent alternatives (RPAs) recommended through consultation regarding hydropower projects may be broadly divided into three major categories: operational, capital, and programmatic. Operational changes include changes in hydropower production level or method, and may be engendered by modification to flow regime.[11] Capital modifications involve direct investment in new or improved infrastructure, and require additional investment for regular operation and maintenance.[12] Programmatic changes include all other types of modification including monitoring of fish passage efficiency and water quality, data collection and research, operation of fish hatcheries, predator control, habitat improvements or restoration, and purchase of land and water rights.[13]

D 2.3 Cost Assessment

We use the current operations and existing structures of projects as a baseline for assessing the costs of modifications. Costs of RPAs for specific dams that have been recommended and implemented through past consultations are therefore not included as costs of section 7 implementation. This base case establishes the level of modification to existing operations and facilities that may be recommended through section 7 consultation in the future. Cost estimates for RPAs likelt to be imposed in the future are based on a review of past economic studies, surveys of hydropower project operators, and available industry expenditure data.

We estimated the potential costs of project modifications for 378 hydropower projects in California, Idaho, Oregon, and Washington. As part of this effort, utility companies and Public Utility Districts (PUDs) were contacted regarding the costs of anticipated project modifications to comply with the

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10. Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. §§ 839-839h.

11. From a review of historical section 7 consultations regarding hydropower activities, recommended operational changes include: improve and manage flows through additional flow augmentation; reduce flow diversions; provide spill to increase fish passage efficiency; operate pools within a specified range; operate turbines within a specified range of efficiency; shut down turbines seasonally; draw down reservoirs; and implement restrictions on ramping rates.

12. From a review of historical section 7 consultations regarding hydropower activities, capital modifications include: constructing and maintaining fish passage facilities (including ladders and screens where applicable); collection and transport of fish at particular sites; installing improved juvenile sampling facilities, surface bypass collectors, and/or spillway weirs.

13. Programmatic changes from a review of a number of historical section 7 consultations include: implementing or improving capture and release programs (e.g., enlarging transport barge exits); monitoring, evaluation, and research programs; gas abatement programs; participation in research initiatives (e.g., investigating bypass improvement methods); managing riparian vegetation; controlling erosion and sediment; implementing timing constraints on instream construction; and increased pollution control standards.

ESA for Pacific salmon and O. mykiss. Where project-specific costs were available from these contacts (17 projects in the Northwest Region), we used these figures in the analysis. Total per-project costs for these projects range from approximately $162 thousand to $136 million.

Five hydropower projects within the proposed designation are currently slated for removal. These projects are anticipated to bear a one time cost of $24 million in capital costs of deconstruction ($18 million) and land donation ($6 million).[14]

For other cases, where we do not have information on the specific per-project costs associated with section 7 implementation, we determined the likely suite of project modifications that may be recommended based on review of historical consultations. We aggregated the costs associated with these project modifications to determine potential ranges in total cost associated with section 7 implementation. To refine these estimates, we divided hydropower projects into six cost categories based on their relative level of power generation, and status of fish passage provisions.

For the majority of projects, we assume the costs of project modifications are incurred uniformly over a ten year time period beginning in the year of potential section 7 consultation. There are four exceptions: (1) dam removal costs are anticipated to occur in a single year, the year of decommissioning and deconstruction; (2) costs associated with small projects are assumed to occur in one year to be consistent with the treatment of non-hydropower dams; and (3) project modification costs associated with 11 of the projects employ a specific cost allocation formula provided by the project owners.[15] The present value of the cost estimates for each category is described in Table D-1.

Not included in the per-project cost estimate is the potential economic impact of certain operational changes. Recommendations to augment flow or change the timing of flow through a project to facilitate fish passage can have significant economic impacts on a hydropower dam. Demand for power varies seasonally, thus the value of power changes throughout the year. To the extent that flow augmentation requires water to be passed at times of the year when it is less valuable, there may be an associated economic cost. Also, where fish passage through the dam is an issue, seasonal spill over of the dam may be required to reduce the risk of fatality associated with passage through the turbines. In this case, the spilled water no longer passes through the turbines and therefore cannot be used to generate electricity. The costs of more expensive electricity may be passed on to the power consumers in the form of rate changes (Peters 2003). Table D-2 highlights examples of anticipated cost impacts associated with flow regime changes for Pacific salmon and O. mykiss at various projects throughout the designation.

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14. Based on anticipated costs of dam decommissioning and removal of the Sandy River Project from an interview with Portland General Electric (2003).

15. For these projects, four percent of costs occur each year for 2004 through 2018, two percent of costs occur each year from 2019 through 2033, and 0.5 percent of costs each year from 2034 through 2053, survey of Portland General Electric, December 2003.

Table D-1 Estimated Costs of Project Modifications for Hydropower Dams			
Project Category (# of dams)	**Installed Capacity of Project (MW)**	**Status of Fish Passage**	**Estimated Per-Project Costs of Modifications**
1 (231 dams)	less than 5	N/A	**Present Value of Cost: $2.1 million ($24,000 - $4.2 million)** According to FERC guidelines, hydroelectric projects with an installed capacity of less than five megawatts (MW) may be exempted from the licensing process.[c] Because these projects are not currently generating power, or are generating power in small amounts, estimated costs are based on the project modification costs of non-hydropower dams, which are anticipated to range between from $24,000 to approximately $4.2 million. Each of these projects is assigned a ten percent probability of incurring these costs sometime during the next twenty years.
2 (24 dams)	between 5 and 20	N/A	**Present Value of Cost: $5.75 million ($0 to $11.5 million)** The high-end of this estimate comprises: - capital costs, such as facilities improvements, of $8 million; - species surveys at $2,600 per year for ten years; - research on species survival and passage efficiency at $150,000 per year for ten years; and - water quality monitoring at $200,000 per year for ten years. The low end is for a project where no modifications are required.

Table D-1 Estimated Costs of Project Modifications for Hydropower Dams			
Project Category (# of dams)	**Installed Capacity of Project (MW)**	**Status of Fish Passage**	**Estimated Per-Project Costs of Modifications**
3 (10 dams)	greater than 20	none	**Present Value of Cost: $73.75 million ($11.5 - $136.0 million)** The low end of the range includes: - Species surveys at $2,600 per year for ten years (BPA 1992); - Capital costs, such as facilities improvements, of $8 million, from a survey of 17 hydropower projects in the Northwest United States; - Research on species survival and passage efficiency at $150,000 per year for ten years (Huppert et. al. 1996); and - Water quality monitoring at $200,000 per year for ten years (Huppert et. al. 1996). The high-end of the cost range is the high-end for project modifications to a hydropower project from a December 2003 survey of utility companies and Public Utility Districts in the Pacific Northwest. The estimate includes annual costs of fish-related operations (hatchery and spawning operations, predator control studies, fish ladders and operations, fish survival studies, etc.), fish-related maintenance (fish ladder and bypass maintenance), and associated debt services (surface collector, diversion screens juvenile fish bypass system, etc.) projected over ten years. Not included is the market value of lost power generation as a result of modifications to project operation.
4 (8 dams)	greater than 20	present or not needed	**Present Value of Cost: $45.3 million ($11.5 - $79.1 million)** Where passage facilities were determined to be present or not required, the average costs of related operations and maintenance of these facilities was removed from the high-end estimate in the cost range (i.e., high-end estimate of $136 million less approximately $57 million over ten years of fish passage-related costs) These costs originate from a December 2003 survey of utility companies and Public Utility Districts in the Pacific Northwest.[b]

Table D-1
Estimated Costs of Project Modifications for Hydropower Dams

Project Category (# of dams)	Installed Capacity of Project (MW)	Status of Fish Passage	Estimated Per-Project Costs of Modifications
5 (16 dams)	greater than 20	unknown	**Present Value of Cost: $56.4 million ($11.5 - $136 million)** In the absence of information regarding the presence of fish passage (as is common for the California hydro projects), this estimate reflects the probability of the presence of fish passage based on data from the Northwest Region. In the Northwest, approximately 61 percent of projects with installed capacities greater than 20 MW currently have or do not require fish passage facilities, and 39 percent either do not have facilities or the status is unknown.
6 (35 dams)	unknown	unknown	**Present Value of Cost: $7.53 million ($0 to $136.0 million)** Where installed capacity is unknown, the cost estimate reflects the likelihood of the project having various levels of installed capacity, based on the data from the Northwest, as well as the likelihood that the project will need modifications (10% for projects with installed capacity less than 5MW). In the Northwest region, 81.2% of dams have i.c. of less than 5MW, 6.4% have i.c. between 5 and 20, and 12.4% have i.c. greater than 20MW. These probabilities were applied to the midpoint estimates above to arrive at this cost estimate.

[a] Data on installed capacity of projects and status of fish passage is from the Pacific Northwest Hydropower Database and Analysis System.
[b] The recommendation to install or improve a fish ladder may be brought about through consultation under section 7 of the ESA or through the Federal Power Act. This analysis quantifies the cost of this modification as coextensive with the designation of critical habitat, although in the absence of the designation, the FPA may obligate construction of an adequate fishway.
[c] FERC (2001).

Table D-2 Economic Impacts Associated with Hydropower Dam Flow Regime Changes			
Hydropower Project	**Description of Cost**	**Estimated Annual Cost of Changes to Flow Regime**	**Source**
Rocky Reach Dam	Market Value of Lost Power Generation	$7,130,000	Chelan County Public Utility District February 2004
Rock Island Dam	Market Value of Lost Power Generation	$8,480,000	Chelan County Public Utility District February 2004
John Day Dam	Cost of replacement power from lost power generation associated with dam drawdown	$100,800,000	Huppert et. al. (1996)
Wanapum Dam	Cost of loss generation due to increased summer spill	$80,000,000	Columbia Basin Bulletin (2003)

The necessity, level, and method of flow regime changes accommodate the biological needs of Pacific salmon and O. mykiss at a particular project are determined on a case by case basis. Further, the economic impact associated with a flow regime change is dependent upon the type of project. For example, replacing power generated by peaking projects (i.e., projects that produce hydropower during periods of highest demand) is more expensive than replacing base power production. Until a hydropower project operation is reviewed, the type and level of flow changes necessary and feasible for species and habitat protection is speculative, and so the data needed to estimate these impacts are not available. ***Because of this, the economic impacts resulting from changes in flow regime are not included in the cost ranges associated with each project.*** This likely leads to an understatement of total impacts associated with section 7 implementation for some or all of the ESUs.

Projects belonging to the FCRPS comprise a unique type of hydropower activity. Of the 31 FCRPS hydropower projects, 22 fall within the boundaries of the potential critical habitat for Pacific salmon and O. mykiss, but all projects may adversely affect that habitat through their operations (USBR et al. 2003). The implementation of section 7 for the 13 Pacific salmon and O. mykiss ESUs under consideration has had significant impacts on the FCRPS, both in terms of capital structures and

operations.[16] Attributing these impacts to the designation of critical habitat for a "particular area," however, is problematic for at least two reasons. First, NOAA Fisheries implements section 7 for the FCRPS at the system level, in that the agency applies the jeopardy standard to the system as a whole, not to the operation of individual constituent parts. Because the system spans dozens of watersheds, it is not possible to assign section 7 impacts on an area-by-area basis. Second, the FCRPS is operated as an optimized system subject to constraints, where the optimization involves multiple objectives. The impact of section 7 of the ESA is to add a set of constraints on the system's operation. Because the scale of the FCRPS is so large, this constraint cannot be attributed to a "particular area" on the scale of an individual watershed. Changing the amount or timing of flow at one dam, for example, will produce changes at other dams as the system is adjusted in light of a new constraint. For these reasons, we have included the impacts of section 7 implementation on the FCRPS in this analysis but do not divide those impacts on a watershed-by-watershed basis. As a result, these impacts are treated as an impact of section 7 for the designation of critical habitat, but not an impact of designating a *particular* watershed as critical habitat.

While there is a rich historical record for the FCRPS covering capital, operations, and maintenance expenditures on conservation projects and the cost of power generation lost or replaced due to conservation measures, this record does not clearly distinguish impacts attributable to the implementation of section 7 from impacts attributable to the Northwest Electric Power Planning and Conservation Act . Moreover, NOAA Fisheries has issued a draft revised biological opinion covering the FCRPS but will not issue a final opinion until November 30, 2004, making it difficult to project what impacts will occur subsequent to critical habitat designation. With these *caveats* in mind, we note that a recent NOAA Fisheries report to Congress (NMFS 2004g) estimated that BPA's 2003 expenditures on fish and wildlife conservation measures totaled approximately $532.9 million, $503.6 million of which is attributable[17] to some of the 13 Pacific salmon and O. mykiss ESUs under consideration. Table D-3 gives the details of these expenditures.

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16. Section 7 of the ESA was first applied to the FCRPS in 1995, which predates the listing of the 13 ESUs under consideration. The ESUs covered in that biological opinion were Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon.

17. Of the 13 Pacific salmon and O. mykiss ESUs under consideration, 9 are affected by the FCRPS. There are also 3 other ESUs not under consideration (Snake River Basin fall chinook salmon, Snake River Basin spring/summer chinook salmon, and Snake River Basin sockeye salmon) that are also affected by the FCRPS. We attributed the expenditures to the Pacific salmon and O. mykiss ESUs in the following way. For Fish & Wildlife Direct Program costs, we multiplied the reported Annual Cost by the proportion of Fish & Wildlife Direct Program costs for FY2001 and FY2002 that were attributable to anadromous fish, as reported in Table 3, Appendix A in NPCC (2004). We applied the same proportion to the Transmission Annual Cost. For Lower Snake River Compensation Plan Hatcheries Annual Costs, we used a factor of 50%, which reflects the approximate proportion of the steelhead smolts in the total release of the hatcheries covered by the plan (FWS 2002).

Table D-3 Impacts of Section 7 Implementation on the FCRPS		
BPA Program Element	**Annual Cost (millions)**	**Annual Cost attributable to 13 ESUs (millions)**
Fish & Wildlife Direct Program	$139.0	$111.2
Treasury Repayment for Past Capital Investments[18]	$56.7	$56.7
Operations and Maintenance (for fish)	$33.4	$33.4
Lower Snake River Compensation Plan Hatcheries	$15.1	$7.6
Power Planning Council	$4.0	$4.0
Transmission (attributable to fish and wildlife)	$34.7	$27.8
Lost/replacement power generation[19]	$250.0	$250.0
Total Annual Costs	**$532.9**	**$503.6**

Whether these figures accurately reflect future levels of impacts is unknown.

D 2.4 Spatial and Temporal Distribution of Activity

We used latitude and longitude data from the Pacific Northwest Hydrosite Database (Bonneville Power Association) to locate hydropower dams in the Northwest region, augmenting those data with geospatial data from USACE National Inventory of Dams.[20] Latitude and longitude of hydroelectric projects in the Southwest region are from the USACE National Inventory of Dams and California Department of Water Resources (1993).

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18. This amount represents depreciation, amortization and interest on fish and wildlife capital investment, both for past Congressional appropriations of approximately $85 million annually for Corps of Engineers capital improvement at dams, and for the capital portion of BPA Fish and Wildlife program (for example, to construct hatcheries), funded by Treasury bonds.

19. About 10% of the productive capacity of the Federal hydropower system is devoted to spill and flow augmentation. The cost of these measures varies considerably from year to year. In 2003 it was approximately $250.0 million.

20. Bonneville Power Administration, The Pacific Northwest Hydropower Database and Analysis System (NWHS); USACE, National Inventory of Dams, accessed at http://crunch.tec.army.mil/nid/webpages/nid.cfm.

In order to determine the likely date of consultation for a dam, we made a series of assumptions based on the nature of the federal nexus . For FERC-licensed dams, section 7 consultation and subsequent project modification are anticipated to begin concurrent with the expiration of the current FERC license as part of the relicensing process. Federal dams are not subject to FERC relicensing and, as such, operations may not be reviewed on a standard schedule. This analysis assumes that consultation for each Federal project will occur sometime within the next 10 years. We assumed the probability that the consultation will occur in a given year is uniformly distributed through this period (i.e, a consultation has a ten percent probability of occurring in any given year). For small projects, we assumed that consultation has a ten percent chance of occurring at all over the next 20 years (consistent with the treatment of non-hydropower dams), with the annual probability uniformly distributed through this period.

Limited data exist regarding FERC relicensing schedules for hydroelectric projects in the SWR. Where this information is not available, this analysis conservatively assumes that consultation will be initiated within next 30 years due to the fact that FERC licenses typically last 30 to 50 years. For these projects, this analysis assigns an equal probability to consultation beginning in each year over the next 30 years.

D 2.5 Annual Expected Modification Cost Estimates

Unlike most other activity types, the cost estimates for hydropower dams are a mix of specific cost information for some dams and general estimates for the others. Table D-4 illustrates the annual expected modification costs[21] for the general estimates associated with each cost category as described in Table D-1.

D 2.6 Assumptions and Potential Biases

Table D-5 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

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21. Because 17 projects were assigned project-specific modification cost estimates, those specific estimates are not included in this table. Also, the dams slated for removal are also not included in this table, as the date for removal is known in each case. In both cases, the costs are included in the estimated impacts for the corresponding watershed.

Table D-4 Estimated Annual Expected Per-Project Costs for Hydropower Dams			
Activity	**Sub-activity**	**Present Value of Costs**	**Annual Expected Cost**
Hydropower Dams	Installed capacity is less than 5MW	$2,120,000	$10,600
	Installed capacity between 5 and 20 MW	$5,750,000	$115,000
	Installed capacity is greater than 20MW; fish passage may be required	$73,850,000	$1,477,000
	Installed capacity is greater than 20MW; fish passage already present or unnecessary	$45,230,000	$904,600
	Installed capacity is greater than 20 MW; fish passage status is unknown	$56,390,000	$1,127,800
	Installed capacity unknown	$7,400,000	$246,667

Table D-5 Hydropower Dams: Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
To estimate the expected start date for future consultation, we employ a combination of methods based upon FERC relicensing schedules, operating review schedules for certain Federal dams, and a 30 year uniform probabilistic distribution of consultation for the remaining dams. In addition, it is assumed that once consultation and modifications commence, related expenditures will occur uniformly over a ten year time frame following consultation. In reality, start dates, duration, and distribution of consultations and modifications across all dams may vary from these assumptions.	+/-
We assume that the level of installed capacity is a key determinant of the level of project modification that may be required in order to meet the requirements of section 7.	+/-
Project modifications recommended in biological opinions are included in this analysis, even if they appear to overlap particular baseline elements, such as fish passage provisions.	+

Table D-5 Hydropower Dams: Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
We assume that each hydropower project will experience an individual consultation. In reality, a consultation may cover more than one project. To the extent that costs of particular project modifications associated with a single consultation may be jointly borne by the project owners, this analysis may overstate its costs.	+
Hydropower projects may be required to provide additional flow for salmon and O. mykiss and, as a result, may experience economic impacts to the extent that increased flow results in decreased or redistribution of power generation. The likelihood of a particular project being required to provide flow for salmon and O. mykiss will depend on many factors, including biological significance of the dam project to salmon/O. mykiss survival and recovery, the seasonality of flow, the economic importance of the dam project, whether there is public concern over the project, and other factors. As a result, costs associated with flow requirements are not included in the cost estimates.	-
To the extent possible, this analysis uses the location of dam infrastructure for the spatial analysis. Certain instances have been identified where dam locations vary across different data sources. The location of every dam in the data layers has not been independently corroborated.	+/-
- : May result in an underestimate of real costs + : May result in an overestimate of real costs +/- : Has an unknown effect on estimates	

D 3. Non-hydropower Dams and other Water Supply Activities

D 3.1 Overview

- The analysis examines the impact of section 7 implementation for Pacific salmon and O. mykiss on both construction and improvement of water supply infrastructure for agricultural and municipal/industrial uses as well as the operation, or flow regime, of non-hydropower dams.

- Approximately three percent of the consultations on Pacific salmon and O. mykiss over the past three years were associated with water supply activities (not including consultations pertaining to dams with hydropower operations). These water supply activities include flood control activities, pumping plants, water diversions, water intake structures, and fish screen projects.

- Construction and infrastructure improvement projects have been modified in design, scope, maintenance requirements, and/or monitoring requirements as a result of section 7 consultation for Pacific salmon and O. mykiss. Water project operations have also been modified to make available minimum (sometimes maximum) instream flows for aquatic species.

- Costs of non-hydropower dam infrastructure modifications to comply with section 7 requirements are estimated to cost $2.1 million ($24,000 to $4.2 million).

- We assume that all federally regulated non-hydropower dams and dams with large reservoirs (defined as dams in the 90th percentile or higher of reservoir storage capacity) are certain to bear modification costs at some point over the next 20 years. Other non-hydropower dams are assumed to have a ten percent probability of bearing consultation costs over the next 20 years.

- Costs to provide additional water flow or change the flow regime for salmon and/or O. mykiss are difficult to estimate reliably. Data on water quantity changes attributable to section 7 implementation, now and in the future, do not exist. There also is no consensus on the flow requirements likely to be recommended in the future. Further, attributing costs to provide flow to a specific watershed is difficult because water supply constraints in one watershed often have effects that are realized throughout the water system. As a result, this analysis does not integrate costs associated with providing additional flow for salmon into the impact assessment. We provide contextual detail regarding these impacts based on a literature review in Appendix E

D 3.2 Background

Water supply activities captured in this section include actions related to flood control activities, pumping plants, water diversions, water intake structures, and fish screen projects. Generally, Federal agencies, State agencies, regional public agencies, and regional private agencies supply water to end users by means of highly developed water systems consisting of dams and reservoirs, pumping plants, power plants and aqueducts. Agriculture relies on water diversion for irrigation of crops. Municipal suppliers provide water for both commercial and residential use. For a detailed discussion of significant water projects in salmon habitat areas, refer to Appendix E.2.

Operation of the Federal water projects is subject to section 7 consultation under the ESA. In addition, because some California State Water Project (SWP) facilities are used jointly with the Federal Central Valley Project (CVP), the SWP is also subject to consultation. Also, any water supplier providing water via contract with U.S. Bureau of Reclamation (USBR) or using USBR owned or maintained infrastructure is subject to section 7 consultation under ESA. Projects associated with privately owned diversions may require a Federal permit from USACE under sections 401 or 404 of the Clean Water Act.

Consultations on non-hydropower dams and other water supply activities represent approximately three percent of the consultations that were conducted on Pacific salmon and ,O. mykiss during 2001-2003. Involved Federal agencies primarily included the Bureau of Reclamation, U.S. Army

Corps of Engineers, Bonneville Power Administration and Natural Resources Conservation Service. Other agencies involved in water supply consultations included the Department of Housing and Urban Development, Bureau of Indian Affairs, National Parks Service, and U.S. Forest Service.

The recent historical Pacific salmon and O. mykiss consultation record suggests that the most common water supply activities resulting in section 7 consultations are related to construction or improvement of dams, diversions, and intakes. Infrastructure construction projects have been modified in their design, scope, maintenance requirements, and/or monitoring requirements in order to comply with section 7 for Pacific salmon and O. mykiss. In the past, NOAA Fisheries has stipulated that alternative project designs be developed if the proposed design is believed to jeopardize listed species or adversely modify critical habitat. Design changes may require additional engineering and planning. NOAA Fisheries has also recommended adding additional components to a project. For example, to improve habitat in the area surrounding a project, NOAA Fisheries has required rock or woody debris be added to the site. The agency has requested monitoring devices be installed or additional data be collected by the Action agency or permit applicant. NOAA Fisheries has also requested a suite of other minor facility operation and maintenance requirements.

USBR water project operations, State operations, and regional water agency operations have been modified to make available minimum (sometimes maximum) instream flows for salmon, O. mykiss, and other aquatic species. In addition, NOAA Fisheries has recommended that flow fluctuations associated with reservoir operation be minimized. The agency also has stipulated that water project gate and pump operations be altered. Sometimes, NOAA Fisheries stipulates temperature objectives be pursued, or it may recommend research and monitoring of project operations.

The extent of flow regime changes are the most difficult to forecast. Recommended modifications are location-specific and vary according to multiple factors, including the type of facility, the purpose of the facility, the regional importance of the facility, the presence of salmon and O. mykiss, the season of use, and other factors. There also does not appear to be a consensus within NOAA Fisheries on the flow requirements likely to be recommended for individual projects.

D 3.3 Cost Assessment

The USDA Natural Resource Conservation Service (NRCS) consults with NOAA Fisheries on projects related to water withdrawal for irrigation and other agricultural projects that may affect fish habitat. Costs potentially attributable to section 7 implementation also are imposed on municipal water intake construction projects. For the latter case, we researched specific municipal water intake construction case studies by contacting project managers. In addition, an analysis of the PNHD database suggests that costs to install fish passage and fish screens may range from $92,000 to $4.2 million. Table D-5 presents the case studies, cost categories, and specific costs identified. Because non-hydropower dam projects may bear any combination of the modifications we have identified, costs are estimated to range from $24,000 to $4.2 million. We use the midpoint of this range, $2.1 million, as our cost estimate, which we assume will be borne over one year.

Table D-6 Case Studies of Operational Modification Costs for Nonhydropower Dams		
Case Study	**Cost Categories**	**Per-Project Costs**
Lincoln City Municipal Water Intake Project on Schooner Creek, Siletz River Basin, Oregon	Engineering costs	$100,000
	Construction costs	$150,000-$220,000
	Monitoring costs	$25,000
	Habitat enhancement costs	$25,000
	Legal fees	$30,000
	Delay costs	$10,000
	Annual data collection & monitoring costs	$130,000-$260,000
City of Pendleton Water Intake and Pump Station Project, Oregon	Engineering costs	$20,000
	Construction costs	$4,000
Taylor Water Treatment Intake Project, Upper Willamette River Basin, City of Corvallis, Oregon	Construction costs	~$500,000
City of Boardman Collector Well No. 2 Project, Columbia River, Oregon	Flow replacement costs (One-time cost)	$100,000-$2,500,000
United States Army Corps of Engineers permitting of the proposed installation of gallery wells within the Nacimiento River, San Luis Obispo County, California	Administrative costs only	Administrative costs only
PNHD database	Fish screen and fish passage installation	$92,000 to $4.2 million
Range		$24,000 to $4.2 million

Due to the complexity of water systems present in the critical habitat re-assessment area, quantification of costs attributable to section 7 implementation on system operation is difficult. We considered a variety of data sources that document the potential magnitude of costs qualitatively, including research from economic literature, engineering literature, related litigation, and data from water project environmental funding reports. Table D-7 presents an overview of the information we reviewed. The table identifies the change in water quantity considered and the estimated dollar value associated with that change. Appendix E.1 presents a more detailed review of this literature.

Table D-7 Studies of Water Supply Costs Related to Water Project Operation		
Case Study	**Quantity of Water***	**Cost**
Hamilton and Whittlesey (1996), Average Annual Costs of Flow Augmentation	4.6 MAF	$291.7 million
	3.5 MAF	$234.3 million
	3.2 MAF	$214.4 million
	1.95 MAF	$155.3 million
	1.08 MAF	$81.4 million
Huppert et al. (2004), Effects on Agricultural Production as measured by Gross Revenue	1 MAF	$752.9 million
	700 KAF – 1 MAF	$476.2 – $752.9 million
	569 KAF – 1 MAF	$349.0 - $752.9 million
USBR (1999)	1 MAF	$90.2 - $243.7 million
CALFED Environmental Water Account, Cost of Fish Protection Measures	374,000 AF	$58.9 million
	227,000 AF	$32.14 million
*Average annual flow augmentation (MAF = million acre-feet; AF = acre-feet)		

As illustrated in Table D-7, water supply constraints can produce substantial economic impacts. Unfortunately, it is difficult to quantify and spatially distribute these impacts with any predictable degree of accuracy. While historical data exist to inform our understanding of the value of the lost water or agricultural production that may result, data on water quantity changes attributable to section 7 implementation, now and in the future, are not available.

In addition, it is difficult to attribute the costs of flow changes to a specific watershed. Flow changes at one point in a watershed often have biological effects that are felt downstream or even upstream. If these effects extend beyond the border of the watershed, designation of the neighboring watershed or even others further away may trigger constraints on those activities. This means that the impact cannot be attributed to a single area's designation, but instead could come from the designation of any of a number of areas. Spreading costs equally throughout the water system is unsatisfactory, as the costs are triggered jointly, not accumulated as more watersheds are designated. . ***For these reasons, the economic impacts resulting from changes in flow regime are not included in the cost ranges associated with each project.*** This likely leads to an understatement of total impacts associated with section 7 implementation for some or all of the ESUs.

D 3.4 Spatial and Temporal Distribution of Activity

We used latitude and longitude data from the USACE National Inventory of Dams to locate dams other than hydropower projects. This database provided spatial information on 1454 dams. Dams

in the Pacific Northwest Hydrosite Database that are not currently producing hydropower and have a purpose in addition to hydropower (e.g. flood control or recreation) were also included.

Limited data exist regarding maintenance schedules for non-hydropower projects. Unlike FERC-licensed hydropower dams, nearly all non-hydropower dams lack a specific event similar to FERC licensing that would enable us to identify an exact date for consultation. Instead, we assumed that for most types of non-hydropower dams, a consultation will occur sometime over the next 20 years. We chose this period based on the historic frequency of consultation for these project types. For all Federally-regulated dams and dams with large reservoirs, we assume that they will incur modification costs with certainty sometime during that period. We assumed a uniform distribution for the probability that the modifications would occur in a given year. All other non-hydropower projects are assigned a ten percent probability of incurring modification costs during this period.

D 3.5 Annual Expected Modification Cost Estimates

As noted above, we assume that modification costs are borne in one year; Federal and large non-hydropower dams are certain to bear these costs during a 20 year period; and smaller non-hydro-power dams have a 10% chance of bearing these costs during the 20 year period. Using the cost estimates derived above, the annual expected modification cost estimates are given in Table D-8.

Table D-8
Estimated Annual Expected Per-Project Costs for Non-hydropower Dams

Activity	Sub-activity	Present Value of Costs	Annual Expected Cost
Non-hydropower dams	Federal and large dams	$2,120,500	$106,025
	Small non-Federal dams	$2,120,500	$10,603

D 3.6 Assumptions and Potential Biases

Table D-9 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-9 Nonhydropower Dams: Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
Impacts related to flow regime are difficult to model, because information concerning specific anticipated changes to flow across the designation at each relevant dam are unattainable. In addition, the specific critical habitat areas engendering changes in operations at a particular dam may be located distantly from the affected dam, and areas affected by changes in flow may be, in turn, distantly located from the dam. Thus, because impacts from changes in flow result from broad and interrelated system changes across large areas, and changes are not easily predicted, these potential impacts are not quantified in our analysis.	-
Each non-hydropower dam within critical habitat areas is assumed to be subject to some level of modification costs over the next 20 years (though in most cases, a low probability of bearing these costs is assumed). In fact, many projects may not be subject to section 7 consultations.	+
Project modifications included in biological opinions for non-hydropower dams are included in this analysis, even if they appear to overlap baseline elements. As a result, the impact of section 7 implementation over and above the baseline may be overstated.	+
Specific infrastructure costs and impacts attributable to critical habitat designation for most non-hydropower dams are not available. As a result, the cost and impacts identified are based on a relatively small sample of projects, and may not precisely capture impacts incrementally attributable to critical habitat or Section 7 of the ESA.	+/-
- : May result in an underestimate of real costs + : May result in an overestimate of real costs +/- : Has an unknown effect on estimates	

D 4. Federal Lands Management (including grazing)

D 4.1 Overview

- The analysis assesses impacts on Federal land management activities that will result from section 7 implementation for Pacific salmon and O. mykiss on USFS and BLM lands within areas of potential critical habitat. A review of recent consultation history shows that nearly 18 percent of section 7 consultations for Pacific salmon and O. mykiss are conducted with the U.S. Forest

Service (USFS) and Bureau of Land Management (BLM) on various land management activities.

- Since the mid-1990's, the Northwest Forest Plan and PACFISH have altered the priorities of the Federal land management agencies, and provided a strong management baseline for anadromous species protection. As a result, future impacts of section 7 implementation of the ESA, particularly in areas where the Northwest Forest Plan and PACFISH exist, are likely reduced from what they would have been absent these other protections. Nevertheless, this analysis includes project modifications as they appear in biological opinions, some of which may overlap with these baseline protections. As a result, this analysis may overstate the additional costs of section 7 implementation for Pacific salmon and O. mykiss.

- We estimate section 7 costs for 10 categories of land management activities, and develop a regional per acre estimate of these annual costs across five geographic regions:

  - Idaho: $1,260 ($680 to $1,840) per 1,000 acres
  - Western Oregon/Washington: $5,900 ($3,080 to $8,710) per 1,000 acres
  - Eastern Oregon/Washington: $3,300 ($1,620 to $4,980) per 1,000 acres
  - Northern California: $8,950 ($4,910 to $12,980) per 1,000 acres
  - Southern California: $12,160 ($6,040 to $18,270) per 1,000 acres

- Impacts on livestock grazing estimated to result from future section 7 implementation for Pacific salmon and O. mykiss are $29,000 ($11,000 to $47,000) annually per 1,000 acres of grazing land.

- Under this methodology, watersheds containing the largest acreage of Federal lands within each geographic region will bear the highest costs associated with modifications to Federal lands management.

D 4.2 Background

A Federal nexus exists for all management activities occurring on Federal lands. We have grouped the activities of the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) into one "activity" category because the agencies have many similar land management goals and regulations, and because they frequently consult together. Activities conducted by the USFS and BLM are wide-ranging, but include fuel reduction activities, road construction, road obliteration, and road maintenance, maintenance of recreation facilities, fisheries programs, timber sales[22],

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22. The consultation history indicates that NOAA Fisheries consults on timber sales on Federal lands, but not on similar sales on private or other non-Federal lands. Timber sales on non-Federal lands rarely need a Federal permit, and thus do not have a Federal nexus. One section 10 Habitat Conservation Plan (HCP) exists with PALCO (Pacific Lumber Company) and one HCP is ongoing with Simpson Timber Company on private timber activities in California. While NOAA Fisheries will consult internally on the Simpson HCP, the costs of this HCP are derived from section 10 of the

permitting of livestock grazing[23], and permitting of various use permits. We have grouped these activities into two activity types: General land management activities (classified into 10 sub-activities) and permitting of livestock grazing.

Our review of the recent consultation history (2001-2003) shows that nearly 18 percent of section 7 consultations for Pacific salmon and O. mykiss are conducted with the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) on various land management activities. The outcomes of these consultations are likely influenced by several important baseline regulations. In particular, the Northwest Forest Plan (NWFP) and PACFISH guidelines provide numerous baseline protections to Pacific salmon and O. mykiss.

The NWFP defines Standards and Guidelines (S&Gs) for forest use throughout the 24 million acres of Federal lands in its planning area. Specifically, the NWFP provides S&Gs for management of timber, roads, grazing, recreation, minerals, fire/fuels management, fish and wildlife management, general land management, riparian area management, watershed and habitat restoration, and research activities on USFS and BLM lands. To accomplish its goals, the NWFP defines seven land allocation categories, including "matrix lands," areas where the majority of timber is to be taken, and Riparian Reserves and Key Watersheds, where distances from rivers are set within which many activities are restricted.

For Federal lands in eastern Oregon, Washington, Idaho, and Northern California not covered by the NWFP, USFS and BLM have adopted a management strategy specifically for anadromous fish protection.[24] Like the NWFP, PACFISH provides guidelines for timber, roads, grazing, recreation, minerals, fire/fuels management, lands, riparian area, watershed and habitat restoration, and fisheries and wildlife restoration. Standards and guidelines under PACFISH are nearly identical to those in the NWFP.

D 4.3 Cost Assessment

D 4.3.1 Federal land management activities (excluding grazing)

We first classified the (non-grazing) activities typically conducted by Federal agencies or permittees on Federal lands into ten categories using Schedule of Proposed Actions (SOPAs) and past programmatic consultations. We then characterized"typical" project modifications by examining the Reasonable and Prudent Measures and Terms and Conditions from past salmon and O. mykiss

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Act. This analysis does not include costs associated with this HCP.

23. The consultation history indicates that NOAA Fisheries consults on livestock grazing on Federal lands, but does not consult on similar activities on private or other non-Federal lands. The reason for this is that grazing on non-Federal lands rarely needs a Federal permit, and thus does not have a Federal nexus.

24. This strategy was intended to be in place for 18-months, beginning in February of 1995, but continues to be implemented.

biological opinions on these ten activities. Finally, we estimated costs of each identified project modification for each of the ten activities.

Data sources of cost information for Federal lands management activities include more than 20 approved project proposals for Bonneville Power Administration's Fish and Wildlife Grants Program and the Wyden Amendment Watershed Restoration program as well as transportation costs from the State of Washington. Table D-10 presents a list of the typical project modifications characterized for each activity, and a range of costs associated with each category of Federal land management activity. Generally, where multiple cost values were available for a single project modification, we identified a low and a high cost to provide a range of potential costs for each modification. A composite low and high range for each activity was developed using the sum of the ranges for each type of modification

To account for regional variation in the modification costs for Federal land management activities, we first classified all National Forests and BLM districts into five regions based on geography: Idaho, Western Oregon and Washington, Eastern Oregon and Washington, Southern California, and Northern California. These classifications are summarized in Table D-11.

Table D-10
Estimated Costs of Project Modifications for Federal Land Management Activities (excluding Grazing)

Sub-activity	Typical Project Modifications* (per-project)	Project Modification Costs
Road maintenance, aquatic habitat projects, instream work, riparian protection	- Develop an approved spill containment plan - Conduct erosion control measures - Minimize vegetation disturbance - Revegetate stream-side area - Gather/obtain materials needed to complete the project and implement bank stabilization - Minimize brushing in riparian areas by leaving a minimum 10 foot buffer along intermittent and ephemeral streams, and a minimum 20 foot buffer along perennial streams	$48,100 to $211,500
Recreation, site, trail, and administrative structure maintenance and associated public use	- Provide an annual monitoring report - Prevent and minimize erosion from trails	$19,400 to $30,000

Table D-10 Estimated Costs of Project Modifications for Federal Land Management Activities (excluding Grazing)		
Sub-activity	**Typical Project Modifications* (per-project)**	**Project Modification Costs**
Fisheries, wildlife, botany and cultural programs	- Minimize disturbance to fish by training personnel in survey method - Coordinate with other local agencies to prevent redundant surveys	$4,200 to $5,400
Pump chance/helipond maintenance and use	- Dispose of waste on stable site. - Minimize soil disturbance using filter materials such as straw bales or silt fencing - Work with engineering/fire personnel to review proposed activities to minimize potential effects to stream channel conditions and water quality - Water withdrawal with fish prevent must have a fish screen installed, operated and maintained in accordance with NMFS fish screen criteria	$12,000 to $17,600
Rock quarry operations/ornamental rock collecting	- Include erosion control plans for quarries to protect fish	$5,000 to $10,000
Road decommissioning, obliterating, storm-proofing and inactivation	- Develop an approved spill containment plan - Maximize activities during late summer and early fall during dry conditions - A biologist should participate in the design and implementation of the project - Dispose of waste on stable site. Nearby is acceptable if approved by a geotechnical engineer or other qualified personnel	$8,400 to $16,600
Telephone line and power line renewal	- Directionally fell hazard trees toward streams and riparian areas where it is safe and feasible to do so - Conduct erosion control measures - Minimize soil disturbance using filter materials such as straw bales or silt fencing - Rehabilitate and stabilize all disturbed areas by seeding & planting	$4,300 to $22,500

Table D-10 Estimated Costs of Project Modifications for Federal Land Management Activities (excluding Grazing)		
Sub-activity	**Typical Project Modifications* (per-project)**	**Project Modification Costs**
Special use permits	- Prior to issuance of a special use permit, a fisheries biologist shall make a written evaluation of the proposed action and any interrelated and interdependent effects of the action to determine if an individual consultation is necessary - Conduct erosion control measures - Minimize soil disturbance using filter materials such as straw bales or silt fencing - Rehabilitate and stabilize all disturbed areas by seeding & planting	$1,200 to $2,400
Timber sales	- Suspend timber hauling when road conditions become degraded - Install sediment traps along roads - Inspect and monitor roads frequently - Culverts shall be constructed to withstand 100-year floods (as in PACFISH) - No-cut riparian protection zones (RPZ) are defined and are site-specific depending on slope (but seem to follow NWFP).	$17,600
Fuel reduction, timber salvage (non-commercial), logging, thinning	- Minimize take from construction activities by ensuring that an effective spill prevention, containment and control plan is developed, implemented and maintained - Minimize take from vegetation management including salvage harvest and commercial thinning by minimizing adverse effects of key components of O. mykiss habitat - Complete annual comprehensive monitoring report	$40,300 to $115,500

Table D-11 Assessment Regions for National Forests and BLM Districts		
Region	BLM District(s)	National Forests*
Southern California	Bakersfield District Susanville District	**Cleveland National Forest**, **Sierra National Forest**, Los Padres National Forest
Northern California	Carson City District, Ukiah District,	**Six-Rivers National Forest**, **Shasta-Trinity National Forest**, Stanislaus National Forest, Toiyabe National Forest, Tahoe National Forest, Plumas National Forest, Lassen National Forest, Eldorado National Forest
Idaho	Idaho Falls District, Coeur d'Alene District	**Nez Perce National Forest, Payette National Forest, Salmon-Challis National Forest, Sawtooth National Forest**, St. Joe National Forest
Western Oregon and Washington	Coos Bay District, Eugene District, Medford District, Prineville District, Roseburg District, Salem District	**Columbia River Gorge National Forest**, **Mount Baker Snoqualmie National Forest**, **Olympic National Forest**, **Siskiyou National Forest, Siuslaw National Forest**, **Wenatchee-Okanogon National Forest, Willamette National Forest**, Rogue River National Forest, Mount Hood National Forest, Umpqua National Forest, Gifford Pinochet National Forest
Eastern Oregon and Washington	Burns District, Lakeview District, Spokane District, Vale District	**Malheur National Forest**, **Umatilla National Forest**, Ochoco National Forest, Wallowa-Whitman National Forest, Crooked River NG, Deschutes National Forest
*Bold indicates that a SOPA for this forest was used to derive estimates of activity level.		

We next used quarterly SOPA's from National Forests to determine the number of each of the 10 categories of projects that are occurring in each forest on an annual basis.[25] SOPA's include the same types of activities that are typically included in programmatic consultations on Pacific salmon and O. mykiss.

We estimated the annual total land management costs for forests that had available SOPAs by multiplying the number of annual activities of each type by the costs associated with each activity. We then calculated a per-acre cost for each forest that had data available by adding together the estimated costs for each activity and dividing by that forest's total forest acres. Finally, we calculated a regional per-acre cost estimate by averaging the per-acre costs created in the previous step for each forest within the five regions. This enabled us to project costs to forests and land that did not have SOPA information available. Because BLM does not produce SOPA documents, we assume that BLM lands carry out the same mix of activities within a region as the USFS lands. Table D-12 lists the regional cost estimates and their ranges.

Table D-12
Estimated Regional Costs for Federal Lands Management Projects

Region	Cost Estimate (per 1,000 acres)
Idaho	$1,260 ($680 to $1,840)
Western Oregon or Western Washington	$5,900 ($3,080 to $8,710)
Eastern Oregon or Eastern Washington	$3,300 ($1,620 to $4,980)
Northern California	$8,950 ($4,910 to $12,980)
Southern California	$12,160 ($6,040 to $18,270)

This method inherently assumes that every National Forest or BLM District acre within critical habitat areas will bear a cost associated with section 7 implementation for Pacific salmon and O. mykiss. Indeed, several forests have programmatic agreements with NOAA Fisheries that compel them to place certain restrictions on activities within critical habitat areas. Even within critical habitat areas, however, it is likely that some projects will not need to be altered to accommodate salmon needs due to specific geography or specific attributes of the projects.

In addition, project modifications described in biological opinions for land management activities are included in this analysis, even if they appear to overlap baseline elements such as NWFP or PACFISH. As a result, the impact of section 7 implementation over and above the baseline elements may be overstated in areas where those baseline elements are in place. For these reasons, this

25. Carol Brown, Sawtooth National Forest, March 10, 2004, suggested that the SOPA's are a good representation of typical activities that occur within forests in a "typical" year.

analysis likely presents a high-end estimate of the costs likely to be incurred associated with Federal lands management activities.

D 4.3.2 Livestock Grazing

Project modifications for livestock grazing activities in salmon and O. mykiss habitat include fencing riparian areas, placing salt or mineral supplements to draw cattle away from rivers, total rest of allotments when possible, and frequent monitoring. Many consultations consider impacts on salmon and O. mykiss from more than one allotment, and include general instructions to the land management agency to develop general policies (e.g., establish a utilization standard of at least 4 inches of stubble height). For cases where we could not allocate costs to a specific allotment, we applied the total cost of the modification to each allotment. This may slightly inflate estimated costs on a per-project basis.

To determine costs of section 7 implementation for Pacific salmon and ,O. mykiss associated with Federal lands grazing modifications, we first characterized "typical" modifications and estimated their costs by examining Reasonable and Prudent Measures and Terms and Conditions from past salmon and O. mykiss biological opinions on grazing activities on a per-allotment basis. We then determined the number of acres for a typical grazing allotment in the areas under consideration areas using spatial data of allotments in these areas. We used the median number of acres (4,000 acres) in a sample of 4,300 allotments in Oregon, Washington, and Idaho.[26] Finally, we estimated a per-acre cost of section 7 implementation for salmon and O. mykiss for a grazing allotment by dividing the typical per-allotment cost by the number of acres in a typical allotment.

As above, this methodology assumes that each allotment will be required to comply with this full list of project modifications. This is unlikely because some grazing allotments within critical habitat may not contain primary constituent elements for salmon and O. mykiss and so their activity will not be modified as a result of section 7 implementation. In addition the NWFP and PACFISH S&Gs for grazing (GM-1 thru GM-4),[27] and the "Interagency Implementation Team (IIT) 2000

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26. We used ICBEMP spatial data for grazing allotments for Idaho, Oregon, and Washington to determine acreage of each allotment. Allotments with unique IDs were assumed to represent unique allotments. The average acreage in this sample of allotments was 14,200. By using the median acreage, we conservatively assume a higher cost per acre for grazing modifications (Using the median: $11 to $47/acre for grazing modifications; Using the average: $3 to $13/acre).

27. GM-1: Modify grazing practices...that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect anadromous fish. Suspend grazing if adjusting practices is not effective. GM-2: Locate new livestock handling and/or management facilities outside of RHCAs. For existing facilities, assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met. GM-3: Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent the attainment of RMOs or adversely affect listed anadromous fish. GM-4: Adjust wild horse and burro management to avoid impacts that prevent attainment of RMO or adversely affect listed anadromous

Grazing Implementation Monitoring Module" for the Malheur National Forest and other National Forest and BLM Districts in Oregon provide protections to salmon and O. mykiss from adverse effects of grazing activities. Project modifications found in biological opinions for grazing activities are included in this analysis, even if they appear to overlap baseline elements. As a result the impact of section 7 implementation over and above the baseline elements may be overstated.

D 4.4 Spatial and Temporal Distribution of Activity

D 4.4.1 Federal land management activities (excluding grazing)

We used land ownership spatial data to determine USFS and BLM acreage in each watershed based on data collected from the Interior Columbia Basin Ecosystem Management Project (1995). Data include BLM Administrative Unit Boundaries and National Forest boundaries in California, Oregon, Washington and Idaho.

We developed the cost estimates from SOPAs that are available currently, and which generally have a forecast period of two years or shorter. Forest Managers report that these activities are fairly constant, however, and are likely to continue indefinitely at similar rates.[28] We therefore used the annual volume of SOPA activity as an estimate of the typical annual volume. We also assumed that activities that take place on Federal lands are certain to bear modification costs and that these costs are borne in a single year.

D 4.4.2 Livestock Grazing

We identified grazing activity on Federal lands by intersecting spatial coverages for statewide grazing allotments with a USFS/BLM ownership coverage in the area under consideration. In the NWR, we employed the Interior Columbia Basin Ecosystem Management Project (ICBEMP) spatial data for grazing. For California, we collected grazing land ownership data from the *California Digital Conservation Atlas* and used them to determine the locations of future section 7 consultations.

We assume that each acre of Federal lands grazing is certain to bear costs of section 7 implementation at some point over the next ten years (the typical period for a grazing permit) and that the modification costs will be borne in a single year. We also assume an equal probability of the consultation occurring over the ten year period.

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fish.

28. Carol Brown, Sawtooth National Forest, March 10, 2004, suggested that projects listed in quarterly SOPAs are likely to continue indefinitely at the present annual rate

D 4.5 Annual Expected Modification Cost Estimates

Because all costs are certain and borne in one year (by assumption) and the volume of activity per acre is annual, the regional per-acre cost estimate equals the annual expected modification cost for Federal lands management activities. For grazing, the annual expected modification cost incorporates the annual probability of a consultation (10%). These estimates are presented below in Table D-13. The use of a per-acre cost in each case means that costs at the watershed level are larger in watersheds that contain more Federal lands.

Table D-13
Estimated Annual Expected Costs for Federal Lands Management and Grazing

Activity	Sub-activity	Present Value of Costs (per-acre)	Annual Expected Cost (per-acre)
Federal Land Management Activities	Idaho Federal land	$1.26	$1.26
	Western Oregon & Western Washington Federal land	$5.90	$5.90
	Eastern Oregon & Eastern Washington Federal land	$3.30	$3.30
	No. California Federal land	$8.95	$8.95
	So. California Federal land	$12.16	$12.16
Livestock Grazing on Federal Land	Grazing	$29.00	$2.90

D 4.6 Assumptions and Potential Biases

Table D-14 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-14 Federal Lands Management: Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
Each acre of Federal land within critical habitat areas is assumed to be subject to section 7 implementation. In fact, many projects may not affect salmon and O. mykiss habitat.	+
Project modifications included in biological opinions for Federal land management activities are included in this analysis, even if they appear to overlap baseline elements. As a result, the impact of section 7 implementation over and above the baseline elements may be overstated.	+
In some cases, a consultation will cover more than one project. For cases where we could not allocate costs to a specific project (particularly for grazing projects), we applied the total cost of the modification to each allotment. This may slightly inflate estimated project modification costs on a per-project basis.	+
Land management agencies are assumed to carry out the list of land management activities consistently within geographical areas (e.g Cleveland and Sierra National Forests are assumed to conduct the same mix of activities because they fall within the Southern California region). Real variations in geography and management could result in different management activities in each management unit.	+/-
Per-project costs of modifications to specific land management activities are assumed to be uniform across geographic areas (e.g. costs of a fuels management project are assumed to be consistent across all regions).	+/-
On December 8, 2003, NOAA Fisheries and USFWS issued "Joint Counterpart Endangered Species Act Section 7 Regulations" whose purpose is "to streamline projects that fit under the National Fire Plan." These new regulations may alter the future consultation behavior of NOAA Fisheries regarding fuel reduction/fire management activities on Federal lands. If executed as planned, future informal consultations will be streamlined. As a result, our estimated costs of fuel reduction activities would be overstated.	+/-
- : May result in an underestimate of real costs + : May result in an overestimate of real costs +/- : Has an unknown effect on estimates	

D 5. Transportation Projects

D 5.1 Overview

- Transportation projects that affect Pacific salmon and O. mykiss habitat are wide ranging, but may include the widening of a road, the reconstruction of a bridge, or the restoration of a ferry terminal. Examination of the consultation history reveals that roadwork, bridgework, and culvert projects encompass nearly 90 percent of all transportation projects that have been consulted upon.

- Transportation projects can produce environmental impacts that may directly kill or injure salmon and O. mykiss, or may disturb habitat. The impacts can be direct (i.e., riparian destruction during a bridge replacement) or more ancillary (i.e., storm water run-off disturbance following a road widening).

- Our method for estimating section 7 impacts on transportation projects is to measure the direct costs associated with section 7 implementation. We first reviewed the consultation history and spatial data to identify the types and sizes of transportation projects planned to occur. We then combined spatial data with typical project modification costs (fixed and variable) to estimate a cost for each project type and a total cost for transportation activities in each watershed.

- Secondary economic impacts resulting from changes to regional transportation mobility as a result of Section 7 implementation are expected to be minor. The consultation record indicates that transportation agencies can comply with section 7 project modifications without precluding any projects within critical habitat.

- On a per-project basis, project modification costs associated with transportation activities are small relative to other activity types. Because of the large volume of these projects, however, they may prove significant in specific geographical regions. These costs are likely to be borne or passed on to the Federal government, which accordingly will ultimately bear the majority of the costs.

D 5.2 Background

Nearly a quarter of all Section 7 consultations conducted by NOAA Fisheries during 2001-2003 involved transportation projects. These projects may entail the widening of a road, the reconstruction of a bridge, or the restoration of a ferry terminal. The Federal nexus for a transportation project may be through permitting or funding provided by the Army Corps of Engineers (USACE), Federal Highways Administration (FHWA) and/or the Federal Aviation Administration (FAA). The USACE permits bridgework, roadwork, and railroad restoration projects that need Clean Water Act permits. FHWA funds bridgework, roadwork, railroad restoration projects, and ferry terminal maintenance, and the FAA permits aircraft/airport repair and maintenance.

The California Department of Transportation (Caltrans) has been engaged in an ongoing bridge retrofit program since the early 1970's. The 12,000+ bridges in the California Highway System, plus an additional 11,500 city and county bridges are inspected on a biennial basis. A major component of this program is the San Francisco-Oakland Bay Bridge East Span Seismic Safety Project (SFOBB), a major construction endeavor to upgrade the East Span section of the Bay Bridge to make it less susceptible to damage in an earthquake. Though details of the planned upgrade have not been finalized, the project is anticipated to have major economic and environmental implications and may result in a consultation with NOAA Fisheries.

Transportation projects can produce environmental impacts that may directly jeopardize the existence of salmon and O. mykiss, or may disturb habitat. The impacts can be direct (for example, riparian destruction during a bridge replacement) or more ancillary (for example, storm water run-off disturbance following a road widening). Federal agencies involved in transportation projects are required by NOAA Fisheries to modify their activities to avoid both direct and indirect take of salmon. Table D-15 lists both the effects from and the modifications typically required of transportation projects.

Table D-15
Typical Project Modifications for Transportation Projects

Project Types	Effect on Salmon	Typical Project Modifications
Roadwork, Bridgework, Culvert Projects	- In-water work during critical salmon life stages that may disturb spawning and development ability - Pollution of chemicals/waste into stream water by construction/repair machinery - Direct handling of salmon during transportation activities (i.e culvert installation) - Discharge of construction water - Stormwater run-off disturbance to habitat - Stream bank damage during construction activities (erosion and pollution)	- Limit time of in-water work to avoid take during vulnerable salmon life stages - Ensure isolation of in-water work area and proper fish handling methods - Develop effective erosion and pollution control measures - Stormwater management measures - Restoration of construction site through contouring, mulching, seeding and planting with native vegetation - Monitoring and evaluation both during and following construction

Table D-15 Typical Project Modifications for Transportation Projects		
Project Types	**Effect on Salmon**	**Typical Project Modifications**
Other Transportation Projects	- Sound disturbance to salmon habitat due to piling installation - In-water work during critical salmon life stages that may disturb spawning and development ability - Pollution of chemicals/waste into stream water by construction/repair machinery	- Use of bubble curtain to maintain low sounds during ferry restoration - Obtaining hydraulic permit approval from State. - Monitoring and evaluation both during and following railroad restoration project - Construction time limits - Captive breeding, re-establishment and habitat restoration program

Examination of the consultation history reveals that roadwork, bridgework, and culvert projects encompass nearly 90 percent of all transportation projects that have been the subject of a consultation, and so we focus on these categories in our analysis.

D 5.3 Cost Assessment

To determine the costs of section 7 implementation for Pacific salmon and ,O. mykiss associated with transportation projects, we first examined spatial data and recent consultation history to identify the typical characteristics of transportation projects in the areas under consideration. We then developed typical project modifications by examining Reasonable and Prudent Measures and Terms and Conditions from past salmon and O. mykiss biological opinions on transportation projects. Finally, we estimated the costs of each identified project modification. Some costs vary continuously with project scale (usually measured by miles of roadway or feet of stream affected), and so we categorized costs as either fixed or variable depending on the nature of the modification. Data sources for cost information for transportation projects include the *Integrated Streambank Protection Guidelines* (Washington Department of Transportation), published economic analyses, and various other cost studies. Table D-16 lists the estimated costs associated with typical project modifications identified for road, bridge and culvert projects.

Modification costs classified as fixed are incurred once in the course of a project, and do not vary continuously with project scale (e.g. costs of spill prevention plan development, costs of water quality monitoring). A low, medium and high cost level for each fixed project modification cost is presented in Table D-16 to provide a range of potential costs for each modification.

In contrast to fixed costs, some costs are highly dependent on the scale of a transportation project and can be calculated on that basis. These variable costs may include restoration efforts, bank stabilization, and emergency erosion control, and are a function of the length of the waterway affected by the project (or for which mitigation efforts are required). Because data are more widely available for project length than for stream length impacted, we explored the relation between the

two using data on both from biological opinions. Unfortunately, instances where data on both road length and stream length impacted are available are rare, and so we used two cases to develop the following relationship:

$$\textit{Stream Length Impacted (SLI) (ft)} = 100 + 5 \times \textit{Road Length (miles)}$$

Using this relation, the variable cost for a project that impacts *N* feet of stream would be

$$\textit{Total variable cost} = N \times \textit{modification cost estimate (per-foot)}$$

The estimated total modification cost is then the sum of the fixed cost for the project's particular scale and the variable costs as computed above.[29]

Table D-16
Estimated Costs of Project Modifications for Transportation Projects

Project Modifications	Fixed Costs (per-project)*			Variable Costs (per linear foot of stream impacted)
	Low	Medium	High	
Pre-construction Surveys	$4,900	$5,950	$7,000	N/A
Develop and implement a site-specific spill prevention, containment and control plan and remove toxicants as they are released	$5,000	$7,500	$10,000	N/A
Water quality monitoring	$5,000	$17,500	$30,000	N/A
Excavation and relocation of materials during a project where they cannot enter wetlands.	$1,000	$3,000	$5,000	N/A
Bank stabilization	N/A	N/A	N/A	$25.00-65.00
Maintain supply of emergency erosion control materials (slit fence and straw bales)	N/A	N/A	N/A	$2.50-$5.50
Use of boulders, rock, woody materials from outside of the riparian area.	$500	$2,750	$5,000	N/A
Stormwater management measures	$2,000	$2,650	$3,300	N/A

29. In this case, we used the high end of the variable cost range as the representative cost estimate. Although the review of the data sources found projects with variable costs at the lower end of the range, the higher end is applicable in instances that are far more typical. This was not the case for other activities where we found a range of costs.

Table D-16 Estimated Costs of Project Modifications for Transportation Projects				
	Fixed Costs (per-project)*			Variable Costs (per linear foot of stream impacted)
Project Modifications	**Low**	**Medium**	**High**	
Restoration of construction site through contouring, mulching, seeding and planting with native vegetation	N/A	N/A	N/A	$10-$60
Monitoring and evaluation both during and following construction	$4,400	$7,700	11,000	N/A
Construction and implementation of coffer dam (a temporary structure to exclude water during instream work)**	$4,000	$6,000	$8,000	N/A
Ensure isolation of in-water work area and proper fish handling methods (hoop net sampling, electro-fishing)**	$1,000	$2,500	$5,000	N/A
TOTALS	**$27,800**	**$55,550**	**$84,300**	**$37.50-$130.50**
*Scale classes for fixed costs: Low = <1 mile, Medium = 1-10 miles, High = >10 miles **These project modifications only apply to bridge and road projects				

D 5.4 Spatial and Temporal Distribution of Activity

California, Idaho, Washington, and Oregon have produced future transportation plans, which we used to forecast the locations of transportation projects. These plans include spatial information, budget allocation, and road mileage for projected road, bridge, culvert, and transit activities in each state. The plans vary in scope as well as time frame, and thus, the nature of the data varies considerably across regions. Table D-17 summarizes all projected, federally funded transportation projects within the critical habitat designation. Because exact start and completion dates are often difficult to anticipate, this analysis assumes that the projects included in the state transportation plans represent an estimation of the number and types of projects that are completed within a given 5 year period.

Table D-17 Summary of Transportation Projects Affected by Critical Habitat			
State	**Data Source**	**Time Frame for Planned Projects (years)***	**Total Number of Projects within Areas under Consideration**
Oregon	State Improvement Plans (STIP) 2002-2005	3	198
Idaho	State Improvement Plans (STIP) 2002- 2005	3	28
California	California Transportation Investment System (CTIS)	5	543
Washington	6-Year Capital Improvements Plan	6	379
*Although transportation plans differ in time frame, this analysis assumes that all projects listed in each state's transportation plan are completed within 5 years			

D 5.5 Annual Expected Modification Cost Estimates

Using the data in the state transportation plans, we applied the formula given above to each project in the plan. We assumed all modification costs are certain and borne in one year, and that the probability of bearing the costs is uniform through the 5 year period for transportation projects. As a result, the annual expected modification cost for a project is equal to the estimated project cost derived from the formula above multiplied by the probability of occurrence (0.20). Because projects vary in road mileage, the estimated project costs vary as well. Below in Table D-18, we give estimated and annual expected costs for a project that involves the average mileage (3.2 miles).

Table D-18 Estimated Annual Expected Per-Project Costs for Transportation Projects			
Activity	**Sub-activity**	**Present Value of Costs**	**Annual Expected Cost**
Transportation*	Bridges & culverts (small)	$41,778	$8,356
	Bridges & culverts (medium)	$69,478	$13,896
	Bridges & culverts (large)	$98,278	$19,656
	Roads (small)	$36,778	$7,356
	Roads (medium)	$60,978	$12,196
	Roads (large)	$85,278	$17,056
*Transportation costs are presented for a project of average mileage (3.2 miles).			

D 5.6 Assumptions and Potential Biases

Table D-19 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-19
Transportation Projects: Assumptions and Potential Biases

Assumption	Direction of Potential Bias
We assume that all project modifications included in section 7 consultations for transportation projects are implemented specifically for salmon and O. mykiss protection and are not part of the baseline (e.g., these measures would not already be conducted as part of Best Management Practices).	+
Best Management Practices are followed strictly as outlined in state legislation, and do not overlap with recommended project modifications.	+/-
Future methods of compliance with specific project modifications will mirror past methods (i.e., pollution/erosion control plans do not change significantly over time).	+/-
All streams containing salmon and O. mykiss in the area under consideration are assumed to have similar ecological sensitivity with regards to pollution and chemical contamination.	+/-
Transportation projects may include sub-projects within them (e.g., road projects w/ bank stabilization efforts). If sub-projects are constructed as part of a transportation project, project modification costs could be understated. Available data do not allow us to reasonably forecast projects that would include sub-projects, however.	-
Long-term effects of modifying transportation projects in critical habitat areas on regional transportation functions (such as congestion and air pollution) are not included in this analysis. If projects occur that are not included in state transportation plans, this analysis may understate costs.	-
State transportation plans are assumed to include all major federally-funded transportation projects planned to occur over the designated the time period.	-

- : May result in an underestimate of real costs
+ : May result in an overestimate of real costs
+/- : Has an unknown effect on estimates

D 6. Utility Line Projects

D 6.1 Overview

- The analysis separates the category of "utility lines" into two subcategories: pipelines and outfall structures. Overall, utility lines account for approximately two percent of the total consultation activity for the salmon in our consultation record. Most of these consultations are associated with pipeline projects.

- The most common nexuses for utility lines are through the actions of the Army Corps of Engineers (USACE), and the Federal Energy Regulatory Commission (FERC). USACE consults with NOAA Fisheries regarding permits issued Section 404 of the Clean Water Act and/or Section 10 of the River and Harbors Act. FERC consults on pipeline projects that have the potential to affect threatened and endangered species and their habitat.[30] For projects that may impact wetlands or cross water bodies, FERC maintains a list of construction and mitigation procedures. These mitigation procedures include the use of directional drilling, rather than open cut construction, and suggest mitigation activities during the proposal stage (FERC 2003). Therefore, some of the project modification costs estimated to be attributable to salmon critical habitat may be overestimated as these measures may be already required.

- We estimate the per-project costs of section 7 implementation on pipeline and outfall structure projects to be $101,000 ($100,000 to $102,000), using historical project modification costs.

D 6.2 Background

Activities classified as utility lines projects include the installation or repair of pipes or pipelines utilized in gas or liquids; cables, lines or wires used to transmit electricity or communication; and outfall structures of utilities such as waste water treatment plants or powerplants. These activities can impact salmon and O. mykiss habitat through actions such as excavation, temporary sidecasting of excavated materials, backfilling of the trench, and restoration of the work site to pre-construction contours and vegetation.

Table D-20 describes the common project modifications recommended by NOAA Fisheries for each type of utility line activity based on a review of the consultation history. These descriptions illustrate how projects may be impacted by section 7 implementation.

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30. Robert Arvedlund, Federal Energy Regulatory Commission, personal communication, February 25, 2003.

Table D-20 Typical Project Modifications for Utility Line Projects	
Sub-activity	**Typical Project Modifications**
Pipeline Projects	- Use directional drilling - No change in the pre-construction contours - Stockpile soil from the excavation and replace in trench - Minimize roads and other encroachments to the maximum extent possible - Return banklines to original slopes and revegetated with native vegetation - Erosion control
Outfall Structure Projects	- Construction access via a barge from the waterway - Effluent restrictions - Backfill trench with clean sand - Complete site restoration and cleanup - In water work period restrictions - All blasting occurs in the dewatered area of the coffer dams - Provide fish salvage and/or fish passage - Isolate in-water work area
Sources: NMFS (2001), NMFS (2003f), NMFS (2003g), NMFS (2003e).	

D 6.3 Cost Assessment

We used data from local municipalities that have experience with utility line project modifications through consultations with NOAA Fisheries and the USACE to estimate modification costs. Table D-21 lists the typical project modifications associated with each sub-activity and presents a range of costs associated with the corresponding modifications. We assumed that the costs are certain and will be borne in a single year.

Given the available data, we were not able to distinguish between types of utility projects (pipeline projects *v.* outfall structure projects). As a result, we assigned an equal probability to the two types of sub-activities and their estimated modifications costs ($102,000, the midpoint of the range for pipeline projects, and $100,00 for outfall structure projects). The annual expected modification cost for a project is then equal to the midpoint of these two figures, or $101,000 per-project.

Table D-21 Estimated Per-Project Costs of Project Modifications for Utility Line Projects		
Sub-activity	**Typical Project Modifications**	**Estimated Costs**
Pipeline Projects	- Erosion control (rock lining) - Bypass stream corridor - Riparian planning - Directional drilling ($800 to $1,000 per foot)	$5,000 to $199,000
Outfall Structure Projects	- Flag boundaries - Complete site restoration and clean up - Pollution and erosion control plan - Timing restrictions - Construction monitoring by an on-site biologist - Store and replace native soil upon project completion - Implement construction techniques to avoid sedimentation and conduct a sediment survey.	$100,000

D 6.4 Spatial and Temporal Distribution of Activity

We identified the location of utility line projects using data on the latitude and longitude of historic USACE permits on utility lines. We assumed that the historic patterns of these permits are likely to predict the general location of potential future projects, which will then engage in consultations.[31] We assume the annual volume and locations of USACE permits for utility lines are representative of the annual volume and locations of projects that need to be modified to comply with section 7 for salmon and O. mykiss.

We recognize there are limitations associated with using historic data to predict future permitted projects. The main concern is that past location is not a good predictor of future location. Although historic consultations are not a perfect indicator of future consultations, areas of concentrated activity in the past are likely to be areas of concentrated activity in the future and therefore our method produces a reasonable geographic distribution of activity given available data.

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31. Future consultations may also cover pipeline projects permitted by FERC. We attempted to account for these by mapping pipeline right-of-ways in each watershed. We did not estimate modification costs for these right-of-way projects, however, as it was not possible to estimate the likelihood that a future pipeline project will in fact utilize a current right-of-way, and will also be involved in a consultation for salmon and O. mykiss. We therefore limited our analysis to known pipeline and outfall structures.

D 6.5 Annual Expected Modification Cost Estimates

Given the assumptions that all modification costs are certain and borne in one year, and that the annual volume and locations of USACE permits for utility lines are representative of the annual volume and locations of projects that need to be modified to comply with section 7 for salmon and O. mykiss, the annual expected modifications costs are equal to the estimated modifications costs, as shown in Table 22.[32]

Table D-22
Estimated Annual Expected Per-Project Costs for Utility Line Projects

Activity	Sub-activity	Present Value of Costs	Annual Expected Cost
Utility Lines	Outfall structures and pipelines	$101,000	$12,625

D 6.6 Assumptions and Potential Biases

Table D-23 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-23
Utility Line Projects: Assumptions and Potential Biases

Assumption	Direction of Potential Bias
Historic location of USACE permits for utilities and location of right-of-ways are the most reasonable predictors of future locations available.	+/-
Costs associated with implementing past consultations are the most reasonable predictor of future costs.	+/-
Project modification recommendations do not overlap with Federal, state, or local laws.	+
Because there is no way to differentiate between pipelines with FERC and USACE nexuses, half of all pipelines are assigned directional drilling costs.	+/-

32. We adjusted USACE permit data from different districts to account for temporal differences in the data. For example, the data set from the Seattle USACE district covered 4 years, while the data set from the Sacramento district covered 8 years. We estimated the annual volume of projects requiring modifications by dividing the volume we obtained from each district's data by the number of years covered by that district's data set.

Table D-23 Utility Line Projects: Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
Section 7 consultation will not result in any net reduction in utility transmission capability. The same amount of utility lines will be constructed, although potentially at a higher cost and/or in a different location.	+/-
+ : This assumption is likely to bias our results upward. - : This assumption is likely to bias our results downward. +/- : This assumption could bias our results upward or downward.	

D 7. Instream Activities (including Dredging)

D 7.1 Overview

- The analysis assesses impacts on instream activities that are likely to result from section 7 implementation within critical habitat. Instream activities account for approximately 16 percent of the total consultation activity for the salmon in our consultation record. The majority of dredging consultations are encompassed by programmatic consultation with NOAA Fisheries. Some instream projects are addressed in an independent consultation but many are part of larger projects (e.g., pile driving may also be associated with large bridge projects, or an airport expansion has the potential to include dredging).[33]

- Actions associated with instream activities that may affect salmon and O. mykiss include dredging, construction or repair of breakwaters, docks, piers, pilings, bulkheads, boat ramp, and docks. For the purpose of our analysis, we divide instream activities into the following sub-activities: boat dock and boat ramp projects; bank stabilization projects; breakwaters and bulkhead projects; and dredging.

- Consultations on boat dock, boat launch, and bank stabilization projects typically involve USACE permits. Modification to these projects required to comply with section 7 for salmon and O. mykiss include shoreline planting, construction materials restrictions, use of bubble curtains, habitat improvement, spill prevention contaminant control plan, erosion control, and timing restrictions.

- Consultations on dredging projects typically involve a USACE permit. Modifications to dredging include work window constraints, extension of the prescribed work window, additional survey work, and mobilization costs.

33. Wes Silverthorne, NOAA Fisheries, personal communication, January 9, 2004.

- In the San Francisco Bay dredging is regulated by a Long-Term Management Strategy (LTMS) For the Placement of Dredged Material in the San Francisco Bay Region. The LTMS gives dredging windows, disposal sites, and targets for distribution of dumping among sites. NOAA Fisheries treats these permit applications programmatically unless projects cannot occur within the dredging windows and a formal consultation is required. Based on historical project experience, this is expected to occur 14 percent of the time. Because work windows and disposal sites are required by the LTMS these potential project modifications are considered baseline. Therefore, we assume that mobilization costs are the only costs attributable to section 7 implementation.

D 7.2 Background

Instream activities include two broad types of projects: construction, maintenance, repair, or other work that is conducted instream, and dredging. Actions associated with the first type may involve structure removal, excavation, filling, and driving pilings. Most of the consultations on this type of project are associated with dock, pier, and breakwater projects.

Instream activity can affect salmon and O. mykiss in a number of ways. Turbidity associated with instream activities may interfere with salmon and O. mykiss visual foraging, increase susceptibility for predation, and interfere with migratory behavior. Chemicals and waste materials including toxic organic and inorganic chemicals that accumulate in sediment may be directly toxic to aquatic life or a source of contaminants for bioaccumulation in the food chain. The release of ammonia, a common by-product produced in anaerobic sediments, may affect aquatic species as it is re-suspended in the water column. Instream activity may adversely affect invertebrate colonies, which may result in some loss of salmon and O. mykiss prey. For dredging, entrainment can occur when the fish are unable to overcome the water velocities near the draghead and are pulled into the hold of the ship during dredging activities.

Table D-24 describes the common project modifications recommended by NOAA Fisheries for each type of instream sub-activity based on a review of the consultation history. These descriptions illustrate how projects may be modified by section 7 implementation.

Table D-24 Typical Project Modifications for Instream Activities (including Dredging)	
Sub-activity	**Typical Project Modifications**
Boat Dock	- Date restrictions - Temporary silt fences and floating silt barriers to limit sediment entry into river and reduce turbidity effects - Disposal of excavated material at upland disposal site - Assurance of clean, inert material making contact with water - Maintenance of all heavy equipment to insure cleanliness and devoid of external oil, fuel or other pollutants - Strict following of permit and contract requirements - Use of bubble curtain to minimize effects of sound waves from pile driving on listed fish - Minimize creation of predator habitat by minimizing incidental take from heavy equipment use - Minimization of incidental take from use of heavy equipment that may disturb riparian and aquatic systems - Minimization of incidental take from erosion control activities by using best available technology - Removal of one piling and its associated dock
Boat Launch	- Date restrictions - Insure isolation from flowing water to minimize take - Development and implementation of erosion and pollution control measures through area of disturbance - Implementation of measures to minmize impacts to riparian and instream habitat - Implementation of measures to treat water and limit fill within the 100-year floodplain - Ensure temporary/permanent impacts to riparian instream habitat are restored and mitigated

Table D-24 Typical Project Modifications for Instream Activities (including Dredging)	
Sub-activity	**Typical Project Modifications**
Bank Stabilization	- Limit the extent of rock placement in the channel - Spill Prevention Contaminant Control Plan - Erosion Control - Submit a monitoring and evaluation to USACE and NMFS - Replant disturbed areas with native plants with 80 percent survival after three years - Ensure that the in-water work activities (toe trench excavation and scour protection placement) are isolated from flowing water - Use fish screens on all water intakes - Fisheries biologist oversee capture and release program - Move excavated materials to upland areas - Restore all damaged areas to pre-work conditions - Install fencing as necessary to protect revegetated sites
Breakwater	- Minimize incidental take from general construction by excluding authorized permit actions and applying permit conditions - Comprehensive monitoring and reporting program to make sure objectives are met - Equipment will be fueled and lubricated in designated refueling areas at least 150 feet away from stream
Bulkhead	- In-water work restrictions - Fish passage - Removal of treated wood - Restricted use of heavy equipment - Isolation of in-water work area - Compensatory mitigation - Water intake screening - Pollution/erosion control - Capture and release - Conservation of native materials - Earthwork

Table D-24 Typical Project Modifications for Instream Activities (including Dredging)	
Sub-activity	**Typical Project Modifications**
Bulkhead, cont.	- Site restoration - Date restrictions - Minimize disturbance to riparian habitat - Minimize disturbance due to construction barges - Minimized contamination of riverine habitat - Monitoring
Dredging	- Work windows - Dredge-material disposal requirements
San Francisco Bay Dredging	- Dredging windows - Disposal sites - Targets for distribution of dumping among sites
Sources: NMFS (2003a), NMFS (2003b), NMFS (2003c), NMFS (2003d), Peter Losavita, U.S. Army Corps of Engineers, personal communication, December 4, 2003.	

D 7.3 Cost Assessment

We used data from local municipalities that have experience with instream project modifications through consultations with NOAA Fisheries and the USACE to estimate modification costs. Due to data limitations, we were not able to estimate costs separately for bulkhead and breakwater projects, but assume they are included as part of other sub-activity projects. Table D-25 lists the different sub-activities with the typical project modifications and cost estimates.

Table D-25 Estimated Per-Project Costs of Modifications for Instream Activities (including Dredging)		
Sub-activity	**Typical Project Modifications**	**Estimated Costs**
Boat Dock	- Shore line planting. - Paint pilings white. - Bubble curtain. - Planks and floats graded for 60 percent light passage.	$25,000

Table D-25 Estimated Per-Project Costs of Modifications for Instream Activities (including Dredging)		
Sub-activity	**Typical Project Modifications**	**Estimated Costs**
Boat Launch	- Habitat improvements, including native plant installation and replacement of failed plantings - Redesign dock to meet NOAA Fisheries performance standards. - Professional fish biologist to monitor construction.	$28,400
Bank Stabilization	- Spill Prevention Contaminant Control Plan - Erosion Control - Monitoring and evaluation - Replant disturbed areas with native plants with 80 percent survival after three years - Ensure that the in-water work activities are isolated from flowing water - Fisheries biologist oversee capture and release program - Move excavated materials to upland areas - Restore all damaged areas to pre-work conditions - Install fencing as necessary to protect revegetated sites	$34,050 to $84,000
Dredging Projects	- Work window constraint - Extension of the prescribed work window[1] - additional survey work if safety is an issue - Mobilization cost[2] (occurs 14 percent of the time)	$332,000 to $1,310,000[3]
San Francisco Bay Dredging	- Dredging windows - Disposal sites - Targets for distribution of dumping among sites	$42,000 to $140,000

[1]Requires between 40 and 120 man-hours.
[2] If a work window extension is not granted, USACE must complete the project during the next work window. Restarting the project results in additional mobilization costs. Mobilization costs are approximately one third of total project costs.
[3] Personal communication with Michael Dillabaugh, U.S. Army Corps of Engineers, San Francisco District, Operations and Readiness Division, Project Manager, November 24, 2003.

Because of limitations in the spatial data, we collapsed the first three sub-activities – boat dock construction, boat launch construction, and bank stabilization projects – into one sub-activity. We used the midpoint of the associated range of costs as the cost estimate for each sub-activity: $54,500 ($25,000 - $84,000) for the combined instream project sub-activity, and $821,000 ($332,000 - $1,310,000) for dredging. We assume that costs are certain and will be borne in a single year.

D 7.4 Spatial and Temporal Distribution of Activity

We used latitude and longitude location data from historic USACE permits to predict the location of future instream activities. We assume that historic patterns of instream projects are likely to predict the general location of potential future projects over the next eight years (the longest period in the USACE data). We also assume that the annual volume and locations of USACE permits for instream activities and dredging projects are representative of the annual volume and locations of projects that need to be modified to comply with section 7 for Pacific salmon and O. mykiss.

We recognize there are limitations associated with using historic data to predict future permitted projects. The main concern is that past location is not a good predictor of future location. Although historic consultations are not a perfect indicator of future consultations, areas of concentrated activity in the past are likely to be areas of concentrated activity in the future and therefore our method produces a reasonable geographic distribution of activity given available data.

D 7.5 Annual Expected Modification Cost Estimates

As noted above, we assumed all modification costs are certain and borne in one year, and that the annual volume and locations of USACE permits for instream activities and dredging projects are representative of the annual volume and locations of projects that need to be modified to comply with section 7 for salmon and O. mykiss.[34] These assumptions produce the annual expected modification costs for instream projects and dredging shown in Table D-26.

Table D-26
Estimated Annual Expected Per-Project Costs for Instream Activity Projects (including Dredging)

Activity	Sub-activity	Present Value of Costs	Annual Expected Cost
Instream Activities	Boat dock, boat ramps, bank stabilization	$54,500	$54,500
Dredging	Dredging	$821,000	$821,000

34. We adjusted USACE permit data from different districts to account for temporal differences in the data. For example, the data set from the Seattle USACE district covered 4 years, while the data set from the Sacramento district covered 8 years. We estimated the annual volume of projects requiring modifications by dividing the volume we obtained from each district's data by the number of years covered by that district's data set.

D 7.6 Assumptions and Potential Biases

Table D-27 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-27
Instream Activities and Dredging: Assumptions and Potential Biases

Assumption	Direction of Potential Bias
Historic location of USACE permits for instream activities including dredging are the most reasonable predictors of future locations available.	+/-
Costs associated with implementing past consultations are the most reasonable predictor of future costs.	+/-
Project modification recommendations do not overlap with Federal, state, or local laws or best management practices.	+
Range of costs for case studies are representative of all instream activities.	+/-

- : May result in an underestimate of real costs
+ : May result in an overestimate of real costs
+/- : Has an unknown effect on estimates

D 8. National Pollutant Discharge Elimination System Permitted Facilities

D 8.1 Overview

- This analysis examines the potential economic impact to facilities that are required to obtain National Pollutant Discharge Elimination System (NPDES) permits. The EPA and NOAA Fisheries recently authored guidance to States and tribes on the development of temperature criteria deemed protective of salmon and O. mykiss. As a result, NPDES-permitted facilities in the Pacific Northwest are required to ensure effluent discharge does not raise the temperature in receiving waters above site-specific minimum temperature standards (EPA 2003). Facilities employ a range of temperature control strategies to meet these standards.

- The nexus for this activity is EPA's approval of State Water Quality Standards. NOAA Fisheries has consulted with EPA regarding the review and approval of the temperature component of water quality standards. Although a nexus does not apply directly to each NPDES-permitted facility (due to EPA's delegation of permitting to state water quality

agencies), this analysis includes the project modifications and costs resulting from future compliance with the new standards by NPDES-permitted facilities.[35]

- To comply with the temperature criteria, NPDES-permitted facilities identify and employ a host of temperature control procedures through Temperature Management Plans (TMPs). Controls include process optimization, pollution prevention, land application, and cooling towers.

- The analysis estimates the operations and maintenance (O&M) costs and capital expenditures necessary to comply with the temperature criteria. These compliance costs are based on a sample of major and minor NPDES-permitted facilities considered in EPA's Economic Analysis of the Proposed Water Quality Standards Rule for the State of Oregon (Science Applications International Cooperation 2003). The estimated modifications costs are $630,467 ($476,483 - $784,451) for a major facility and $72,039 ($0 - $144,078) for a minor facility.

- Impacts of section 7 implementation resulting from NOAA's consultation on the temperature criteria will vary depending on a facility's compliance with existing temperature standards, and whether it is subject to these requirements at all. To reflect this uncertainty, this analysis assumes that any major NPDES-permitted facility has a 25 percent probability of requiring compliance-related expenditures, and any minor NPDES-permitted facility has a 20 percent chance of incurring related costs.

D 8.2 Background

NOAA Fisheries has consulted with EPA on various aspects of its approval of State Water Quality Standards. Since the species were listed, 14 informal and one formal consultation have been completed, including development of Total Maximum Daily Loads (TMDLs), review of non-temperature related Water Quality Standards, clean up of Superfund sites, and review of pesticide applications. With the exception of pesticide applications, the majority of these activities do not represent a significant portion of the consultation record nor are they expected to increase in the future.[36]

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35. Although California was not part of the Northwest Temperature Guidance Consultation, we assume that similar requirements to protect salmon in that state will lead to similar economic impacts in the future.

36. The Environmental Protection Agency (EPA) was recently enjoined from authorizing the application of a set of pesticides within a certain distance from "salmon supporting waters" (Washington Toxics Coalition, et al., v. EPA, C01-0132 (W.D. WA), 22 January 2004). The basis for this injunction was the EPA's failure to consult with NOAA Fisheries concerning possible adverse effects of pesticide application on ESA-protected salmon and O. mykiss. The effect of this injunction is to create an additional set of activities to be considered in the analysis, in that the restrictions on pesticide use can be viewed as a habitat-related impact of section 7. Because of the timing of the injunction, however, NOAA Fisheries does not yet have sufficient data to estimate these impacts at the watershed level. In Appendix H, we present preliminary estimates of the impacts at the ESU level, and for the designation of critical habitat for all ESUs as a whole.

In general, the only incremental standard that has been affected explicitly by concern for salmon and O. mykiss involves water temperature controls. While NPDES-permitted facilities have always been required to adhere to certain temperature criteria associated with effluent discharge, the 2003 guidance has led to stricter standards where salmon and O. mykiss are known to spawn or rear. As a result, this analysis focuses on costs associated with the temperature criteria.

D 8.3 Cost Assessment

We used EPA's economic impact assessment to estimate modifications costs for NPDES-permitted facilities. The EPA analysis provides cost estimates to meet the spawning and rearing temperature criteria of 18 degrees Celsius for salmon and O. mykiss rearing, 16 degrees Celsius for core juvenile rearing, and 13 degrees Celsius for spawning. Temperature control procedures commonly employed at NPDES-permitted facilities include:

- Process optimization (identifying management procedures that could be altered to reduce thermal loads to waste streams);
- Reduced volume of discharge by reusing effluent;
- Storing heated wastewater;
- Off stream cooling/evaporation ponds; and
- Istalling treatment technology to reduce temperatures.

The EPA analysis assumes that facilities first employ low cost controls and then consider more costly controls, if necessary.

Based on EPA's sample of facilities, we assume capital costs are incurred in the first year, and operations and maintenance (O&M) costs are incurred uniformly over a 20 year period. We divided facilities into two categories, also based on the EPA study. Major facilities are those that may require significant capital expenses to comply with the temperature criteria, while minor facilities need only incur O&M expenditures.

Table D-28 provides a summary of the cost estimates and their ranges, based on the EPA analysis.

Table D-28
Estimated Per-Project Costs of Modifications for NPDES-permitted Facilities

Facility Type	O & M	Capital Cost	Present Value of Cost
Minor	$6,800 ($0 - $13,600)	$0	$72,039
Major	$19,725 ($5,190 - $34,260)	$421,500	$630,467

D 8.4 Spatial and Temporal Distribution of Activity

We identified the location and type (major or minor) of facilities potentially affected by the temperature requirements using latitude and longitude data from the Washington Department of Ecology, the Oregon Department of Environmental Quality, EPA Region 10, and EPA Region EPA Region 9. The data represent the location of facilities as of 2003 or 2004. We assume that if a facility is required to comply with the temperature criteria, it will do so immediately.

D 8.5 Annual Expected Modification Cost Estimates

Based on the EPA's analysis, it is not certain that a facility will in fact incur modification costs. Their analysis focused on a relatively small sample of potentially affected facilities, specifically four major facilities and five minor facilities. The analysis reviewed site-specific monthly effluent and receiving water temperature data from these facilities to evaluate the effect of discharge on receiving waters. Based on this review, EPA concluded that one of the four major facilities would require significant capital expenditures along with incurring incremental O&M costs to comply. Of the five minor facilities, only one would incur incremental O&M costs, while the remaining four would experience no incremental costs.

We employ these ratios as the probabilities that a major and minor facility, respectively, will incur modification costs. Specifically, the analysis assumes that a major facility has a 0.25 probability of bearing modification costs (capital and O&M), and a minor facility has a 0.20 probability (O&M). The resulting annual expected modification costs are shown in Table D-29.

Table D-29
Estimated Annual Expected Per-Project Costs for NPDES-permitted activities

Activity	Sub-activity	Present Value of Costs	Annual Expected Cost
NPDES-permitted activities	Minor facility	$72,039	$1,360
	Major facility	$630,467	$14,878

D 8.6 Assumptions and Potential Biases

Table D-30 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-30 NPDES-permitted Facilities: Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
All states and related facilities are assumed to begin compliance with more stringent temperature requirements in the near term.	+
The sample of major and minor facilities (located in Oregon) considered in the EPA analysis is representative of facilities throughout the designation	+/-
The compliance costs estimated for the sample of facilities considered in the EPA analysis are representative for all facilities	+/-
The ratio of facilities affected by the new standard to facilities not affected in the EPA sample is representative of the ratio in the entire population of facilities.	+/-
All NPDES permit holders within the same class (major or minor) have a similar probability of incurring temperature control compliance costs.	+/-
- : May result in an underestimate of real costs + : May result in an overestimate of real costs +/- : Has an unknown effect on estimates	

D 9. Sand and Gravel Mining

D 9.1 Overview

- Sand and gravel mining activities that affect Pacific salmon and O. mykiss generally include the removal of gravel for industrial purposes, such as for road construction material, concrete aggregate, fill, and landscaping (NMFS 2002).[37]

- Sand and gravel mining is an activity permitted by USACE under sections 401 and 404 of the Clean Water Act, or under section 10 of the Rivers and Harbors Act of 1899.

- Section 7 consultations on sand and gravel mining have produced numerous recommended modifications, but one that is frequently recommended is a limitation that reduces the total amount of gravel that can be removed from salmon and O. mykiss habitat areas.

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37. NOAA Fisheries is in the process of revising this guidance. The draft guidance has a statement almost identical to this one, however.

- Our approach is to apply an average per-mile cost of the net revenue forgone from sand and gravel mining due to section 7 restrictions in areas where sand and gravel mining affects critical habitat. This is likely to overstate the real costs of reducing sand and gravel mining within critical habitat, as alternative mining sites are likely to exist that would allow for substitution to sites outside of critical habitat.

- Impacts of section 7 implementation may be significant to the companies conducting activities within the riparian areas of this designation, though the overall impact of this activity on regional economies is likely to be smaller than other activities. We do not expect that this impact will result in a reduction in the overall market supply of gravel to the impacted regions.

D 9.2 Background

Sand and gravel is commonly mined from active river channels and floodplains for construction aggregate that can be made into concrete, asphalt, road base, and drain rock. Three basic types of sand and gravel mining can take place in salmon and O. mykiss habitat: wet-pit mining, bar skimming or scalping, and dry-pit mining. Wet-pit mining involves the use of a dragline or hydraulic excavator to remove gravel from below the water table and can directly destroy spawning habitat, increase turbidity, increase suspended sediment, and increase gravel siltation in salmon habitat areas. Gravel bar skimming typically occurs above the water table, but is also considered to significantly impact aquatic habitat by destabilizing the banks and increasing suspended sediment (NMFS 2002). Dry-pit mining occurs outside the active stream channel, and typically is considered by NOAA Fisheries to have fewer direct effects on salmon and O. mykiss, although adverse impacts on the stream channel are still a concern.

Sand and gravel mining is an activity permitted by USACE under sections 401 and 404 of the Clean Water Act, or under section 10 of the Rivers and Harbors Act of 1899, and this is the typical federal nexus for consultation. This activity accounts for less than one percent of consultation on salmon and O. mykiss during 2001-2003. Several formal consultations are reported to be underway at present.

D 9.3 Cost Assessment

The sand and gravel mining extraction policy for NOAA Fisheries states that "gravel removal quantities should be strictly limited so that gravel accumulation rates are sufficient to avoid extended impacts on channel morphology and anadromous fish habitat."[38] Following this guidance, most NOAA Fisheries formal consultations on sand and gravel mining include strict gravel removal restrictions. The consultation record typically does not record the original quantities of gravel intended for a permit, however, so it is not possible generally to account for the opportunity cost of

38. NMFS (2002).

these restrictions. Instead, we use information from one case that has sufficient information to estimate this cost.[39]

The case concerned a site mined for 32 years by Joe Bernert Towing (NMFS 2003i). The average annual gravel extraction for this area before the consultation was 281,000 cubic yards (cy). Under the terms of the biological opinion and resulting five-year USACE permit, the average annual removal allowed was 150,000 cy, a 47% reduction. This restriction imposed a loss of approximately 6,600 tons/mile on average for the site. At a value of $6.70/ton (Kohler 2002), the gross value of the forgone production is about $44,500 per mile annually.[40] If net revenue for this industry is assumed to be 25 percent of gross revenue,[41] potential lost net revenues at this site are approximately $11,000 per year, or a present value of $1.35 million for the 30-mile mining area over the 5-year life of the permit.

Because substitute sites may be available to a producer, the actual loss in net revenues may be smaller than amount obtained assuming a substitute site is not used. Because critical habitat may cover a wide area, however, its coverage could create a need to travel a substantial distance to a substitute site, possible rendering the substitute site uneconomical.[42] Without information on the proximity of such substitute sites, we assume that net revenues lost to producers when gravel restrictions are imposed can be estimated in a manner similar to the one used above.

Because the area was mined successfully for 32 years, we consider this area to be a good source of gravel. Clearly, not all sand and gravel mining areas will produce equivalent amounts of product. Moreover, the value per mile of sand and gravel mining activities depends on many factors, including depth of operation. Rough estimates of a few sample sites suggest that per-mile annual production may vary from 3,000 to 30,000 tons.[43] This analysis currently assumes that identified and currently-producing sand and gravel mining sites will produce gravel at rates similar to the ones in the above example.

D 9.4 Spatial and Temporal Distribution of Activity

We identified sand and gravel mining tracts in Oregon, Washington, Idaho, and California using latitude and longitude data from the USGS "Active mines and mineral plants" (1997). We assume

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39. Data on these costs were the most difficult to obtain, and it is likely that the one case for which cost data were available is an exceptional one. For that reason, we have made assumptions in estimating costs that may need revision. We will seek to improve the data for this estimate.

40. It is possible that the age and history of the mine could preclude future mining at the same levels as previously, but this is not known.

41. This figure is a gross operating margin (Risk Management Association 2002). We are seeking better sources of information for this estimate.

42. For every 30 miles that aggregate has to travel, the costs of transportation double (California Department of Conservation 2001).

43. Estimated from sites characteristics included in California Department of Conservation (2001).

that each sand and gravel mining site in the areas under consideration will be involved in a consultation at some point over the next 30 years. We also assume that the probability of consultation in a given year is equal across that time period.

Whether or not a particular site will actually be required to modify its operations depends on many factors, including:

- whether the sand and gravel mining occurs in a salmon- or O. mykiss-bearing stream;
- the type of mining planned (wet-pit mining, bar skimming or scalping, and dry-pit mining)
- whether the planned mining activity will occur during spawning or migration of salmon; and
- whether the planned mining activity already incorporates mitigation measures to reduce sedimentation, bank stability, channel widening, and so forth.

For this reason, we consider that possibility that no modification will be required for a sand and gravel mining operation. Without more detailed information on the distribution of site attributes, we assign an equal probability to the two possible events, modification and no modification. Moreover, we also assume that restrictions will be in effect for five years of the 30 year forecast period, after which a substitute site is used or some other alternative is chosen that eliminates the loss in net revenue.

D 9.5 Annual Expected Modification Cost Estimates

To derive the annual expected modification cost for sand and gravel mining, we combine the cost estimates and assumptions we have made in the following way:

1) If a consultation occurs and modifications are required, the cost of the modifications equals the lost net revenue over a five year period derived from the example above, or $1.35 million.
2) The probability that a consultation will occur in a given year is 0.033, and the probability that the modifications will be required is 0.50.

The resulting annual expected modification cost for sand and gravel mining is given in Table D-31.

Table D-31
Estimated Annual Expected Per-Project Costs for Sand and Gravel Mining

Activity	Sub-activity	Present Value of Costs	Annual Expected Cost
Sand and Gravel Mining	Mining on non-Federal lands	$1,353,065	$22,551

D 9.6 Assumptions and Potential Biases

Table D-32 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-32 Sand and Gravel Mining: Assumptions and Potential Biases	
Assumption	**Direction of Potential Bias**
This analysis assumes that each sand and gravel mining site in critical habitat is likely to bear costs associated with section 7 implementation for salmon and O. mykiss over the next 30 years, and assumes an equal probability of those costs being borne in any one year in that time period.	+
This analysis assumes that substitutes are unavailable to sand and gravel mining companies who are required to reduce mining efforts in salmon and O. mykiss critical habitat areas.	+/-
Impacts attributable to critical habitat designation for specific sand and gravel mining operations are not available. As a result, the cost/impacts identified are based on a small sample of projects, and may not precisely capture impacts incrementally attributable to critical habitat or section 7 of the ESA. In addition, impacts at specific projects are likely to vary.	+/-
This analysis assumes that a typical mining operation will be 30 miles of mining for 5 years, with a profit margin of 25 percent.	+/-
- : May result in an underestimate of real costs + : May result in an overestimate of real costs +/- : Has an unknown effect on estimates	

D 10. Residential and Commercial Development

D 10.1 Overview

- This analysis assesses impacts on residential and commercial development, but excludes impacts that are covered elsewhere (roads, utility lines, and so forth).[44] The most common Federal nexus for residential and related development activities is an Army Corps of Engineers (USACE) permit for construction or expansion of stormwater outfalls, discharge or fill of wetlands, flood control projects, bank stabilization, and instream work.[45]

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44. Infrastructure impacts are captured in the analyses of transportation, instream activities, and utility line projects.

45. Personal communication with DeeAnn Kirkpatrick, NOAA Puget Sound Habitat Conservation Division, Fishery Biologist Southern Puget Sound Region, October 31, 2003. Personal communication with Eric Shott, NMFS Santa Rosa Field Office Section 7 Coordinator, November 5, 2003. Personal communication with Gary Stern, NMFS Santa Rosa Field Office, San Francisco

- We estimate the per-project cost of section 7 implementation on residential and related development projects as $235,000 ($230,000 to $240,000), using costs of implementing state recommended stormwater plans. The estimate includes costs of the stormwater pollution prevention plan, permanent stormwater site plan, and stormwater best management practice operation and maintenance.

- The designation of critical habitat for the Pacific salmon and O. mykiss is unlikely to have significant impacts to this activity by increasing costs to developers, reducing revenues, imposing mitigation costs, or resulting in project delays. The designation of critical habitat will have a negligible impact on regional market supply for residential, commercial, or industrial land and thus the primary impacts will be felt by individual property owners. There are three reasons significant impacts are not anticipated. First, the historical consultation record suggests that section 7 consultation regarding Pacific salmon and O. mykiss are rare. Second, the resulting project modifications are relatively small and/or have been captured by other activities (e.g., utility line activities). Third, the land markets in the proposed critical habitat area are relatively unconstrained (e.g., market substitution to competitive and comparable sites can easily occur). All of these factors contribute to a low impact to development.

D 10.2 Background

The potential for adverse economic impacts arising from constraints on residential and related development is a frequent concern to communities in which critical habitat has been proposed for designation. The nature and magnitude of any economic impact attributable to critical habitat designation will depend upon baseline land and housing market conditions and the extent to which a designation distorts these initial conditions. A common concern is that the designation of critical habitat may reduce the overall amount of land available to the market, and increase the price of developed land and housing.

If critical habitat designation inhibits the development potential of some parcels, the supply of land available for development will be reduced. In areas that are already highly developed, or where developable land is scarce for other reasons (i.e., non-critical habitat-related regulations), this reduction in available land and the corresponding increase in price could be significant, and ultimately translate into fewer housing units being built within the affected market, affecting both producers and consumers. In areas where developable land is relatively plentiful, however, developers and builders will be able to identify substitute sites for projects, thereby limiting economic impacts to the owners of specific parcels that suffer a diminishment in their land's value.

In addition to the primary economic impacts identified above, commenters on previous economic analyses of critical habitat designation have described additional categories of economic and financial effects in residential and commercial development markets, generally falling into the category of regional economic impacts (Elliott D. Pollack and Company 1999). Regional economic

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Bay Team Leader, November 5, 2003.

impacts reflect changes in *local* output, employment and taxes. The principal category of regional impacts associated with critical habitat designation in areas of residential development involves potential changes in revenues and employment in construction-related firms and other industries that support builders and developers. Specifically, commenters have suggested that if development activity decreases in a given area, these secondary industries are likely to suffer severe economic consequences.

A second category of regional impacts identified by commenters to past critical habitat analyses concerns the potential for forgone tax revenues associated with reduced residential development. That is, reduced development potential in an area may lead to lower real estate and other tax revenues. It is important to note, however, that the *net* impact of any expected changes in tax revenues in affected communities. In many cases the change in revenue will be offset by an equal change in municipal expense; thus, it is important that any estimated impacts in this category are net of these service expenditures.

Finally, in more extreme cases, concern has been expressed regarding the broader impact of critical habitat designation on regional economies. Specifically, some individuals have questioned whether designation will delay and/or impair an area's ability to realize economic growth by influencing development patterns. Whether further development of a region is, on net, desirable is a point of contention in many markets. Nonetheless, with the exception of cases in which critical habitat designation precludes a large proportion of available land from development, designation is unlikely to substantially affect the course of regional economic development (Meyer 1998).

In some cases, the public may believe that critical habitat designation will depress private property values below the levels associated with anticipated project modifications described above. That is, the public may perceive that, all else being equal, a property that is designated as critical habitat will be stigmatized and have lower market value than an identical property that is not within the boundaries of critical habitat. Public attitudes about the limits and costs that critical habitat may impose can cause real economic effects to the owners of property, regardless of whether such limits are actually imposed.

The designation of critical habitat for the Pacific salmon and O. mykiss ESUs under consideration is unlikely to increase costs to developers, reduce revenues, impose mitigation costs, or result in project delays, at least in significant amounts. There are two reasons significant impacts are not anticipated. First, unlike terrestrial species, habitat for Pacific salmon and O. mykiss is not itself part of the supply of developable land. For this reason, protection of the aquatic habitat need not take the form of supplanting development if the impacts of the development (whatever they might be) can be mitigated. As a result, section 7 consultations regarding the ESUs for real estate developments are usually limited to specific components of the development and are expected to have no direct impact on the supply of land or housing. Second, as seen in the next part of this section, project modification costs are expected to be modest (anticipated to range from $230,000

to $240,000 per project) and, according to NOAA Fisheries personnel, consultations regarding development projects are rare.[46]

For this reason, the available data also do not support an expectation of significant stigma effects. Section 7 has no strong historical connection to restrictions on private property, and there is no expectation that this lack of a connection will change in the future. If such stigmatization does occur, it seems likely that experience with the actual strictures of critical habitat designation will remove any (negative) premium that might be characterized as a stigma effect.

D 10.3 Cost Assessment

We used information from the Washington Department of Ecology as the basis for our cost assessment (WDOE 2001). Table D-33 lists the typical modifications associated with development projects and presents a range of costs. To determine this range, we combined all potential project modification costs and applied the average project cost to each project. This is likely to be an overestimate because it is the cost of implementing the State of Washington's suggested stormwater management plan and other states may not require as stringent standards as this plan.[47] We assume that costs will be borne in one year.

Table D-33
Estimated Per-Project Costs of Modifications for Development Projects

Activity	Typical Project Modifications	Estimated Costs
Residential and Commercial Development	- Implement state recommended stormwater plans. - Activities to reduce stormwater volume and/or pollutants. - Minimizing hardscape of the outfall structure. - Vegetation replacement.	$230,000 to $240,000

D 10.4 Spatial and Temporal Distribution of Activity

To estimate the volume and location of development-related impacts, we used EPA data on the volume and locations of State-issued NPDES stormwater permits and USACE permit data.

46. Personal communications with DeeAnn Kirkpatrick, NOAA Puget Sound Habitat Conservation Division, Fishery Biologist Southern Puget Sound Region, October 31, 2003; Eric Shott, NOAA Fisheries Santa Rosa Field Office Section 7 Coordinator, November 5, 2003; and Gary Stern, NOAA Fisheries Santa Rosa Field Office, San Francisco Bay Team Leader, November 5, 2003.

47. This guidance document's implementation is not required except in the case of municipal stormwater systems that require a NPDES permit. Implementation may also be required by local zoning laws or as other permit requirements. Personal communication with Ed O'Brien, Washington Department of Ecology personnel, November 7, 2003.

Information from USACE permits for stormwater systems would be the ideal data, as they have information on location, cover development activities, and have a clear Federal nexus. Only one USACE district (Seattle), however, identified stormwater projects in their permit data. NPDES stormwater permits are overly inclusive, as not all State-issued permits are for projects which would require the modifications recommended by NOAA Fisheries (e.g., single family home would not require an extensive stormwater management system).

We therefore needed to find another way to identify potentially impacted projects. We assumed that the ratio of the Seattle USACE stormwater permits (which have a clear Federal nexus) to State-issued NPDES stormwater permits in the area covered by the Seattle USACE district could be applied to other areas. This approach found 86 of the 104 NPDES stormwater permits issued by Washington Department of Ecology from 2000 to 2003 lay within the boundary of Seattle USACE jurisdiction. There were five unique stormwater permits identified in the Seattle USACE data from 2000 to 2003. This proportion (0.058 USACE-permitted stormwater projects per 1 State-issued NPDES stormwater permits) was then used to adjust the volume of State-issued NPDES permits for stormwater projects in a particular area.

In California, we used the facility city location from the Notice of Intent for Stormwater Discharges Associated with Construction Activities under a NPDES general permit from 2000 to 2003. This was done due to the large proportion (90 percent) of missing latitude and longitude points for NPDES permit locations in the NPDES spatial data. We assume that areas of historic permits are likely sites for future construction or replacement of stormwater systems.

We assume that each development-related project is certain to bear these modification sometime during a 20 year period, and that the probability is uniformly distributed over this period.

D 10.5 Annual Expected Modification Cost Estimates

As noted above, we assumed all modification costs are certain and borne in one year, and that each development is certain to bear the costs during a 20 year period. These assumptions produce the annual expected modification costs shown in Table D-34.

Table D-34
Estimated Annual Expected Per-Project Costs for Residential and Commercial Development

Activity	Sub-activity	Present Value of Costs	Annual Expected Cost
Residential and Commercial Development	New development	$235,000	$11,750

D 10.6 Assumptions and Potential Biases

Table D-35 presents the key assumptions of the economic analysis for this type of activity, as well as the direction of potential bias introduced by the assumptions.

Table D-35
Development Projects: Assumptions and Potential Biases

Assumption	Direction of Potential Bias
State and local laws do not require similar provisions to the Minimum Requirements for Stormwater Management of Washington Department of Ecology.	+
Historic location of stormwater permits is the most reasonable predictor of future locations available.	+/-
Stormwater system costs for Washington Department of Ecology recommended systems are the most reasonable estimates of the cost of project modifications for development.	+/-
NOAA stormwater system recommendations do not overlap with state or local laws.	+/-
Other consultations related to development may occur through associated infrastructure and are captured in these other activities.	+/-

- : May result in an underestimate of real costs
+ : May result in an overestimate of real costs
+/- : Has an unknown effect on estimates

D 11. Summary

Table D-36 below summarizes the cost estimates for the different types of activities.

Table D-36 Summary of Activity Cost Estimation							
Activity	**Sub-activity**	**Cost Unit**	**Cost Stream (Duration)**	**Present Value of Cost Stream**	**Forecast Period**	**Probability of Modifications**	**Annual Expected Per-Project Cost**
Hydropower Dams*	Small (0 - 5 MW)	per dam	$2,120,000	$2,120,000	20 years	$p_t = 0.05$ $p_M = 0.10$	$10,600
	Medium (5 - 20 MW)		$5,750,000	$5,750,000	50	$p_t = 0.02$ $p_M = 1.00$	$115,000
	Large (>20 MW), requires fish passage		$73,850,000	$73,850,000	50	$p_t = 0.02$ $p_M = 1.00$	$1,477,000
	Large (>20 MW), does not require fish passage		$45,230,000	$45,230,000	50	$p_t = 0.02$ $p_M = 1.00$	$904,600
	Large (>20 MW), fish passage unknown		$56,390,000	$56,390,000	50	$p_t = 0.02$ $p_M = 1.00$	$1,127,800
	Unknown capacity		$7,400,000	$7,400,000	30	$p_t = 0.033$ $p_M = 1.00$	$246,667
Non-hydropower Dams	Federal and large non-hydropower dams	per dam	$2,120,500 (1 year)	$2,120,500	20 years	$p_t = 0.05$ $p_M = 1$	$106,025
	Small non-Federal Non-hydropower dams					$p_t = 0.05$ $p_M = 0.10$	$10,603

Table D-36
Summary of Activity Cost Estimation

Activity	Sub-activity	Cost Unit	Cost Stream (Duration)	Present Value of Cost Stream	Forecast Period	Probability of Modifications	Annual Expected Per-Project Cost
Federal Land Management Activities	Idaho Federal land	per acre	$1.26 (1 year)	$1.26	1 year	$p_t = 1.0$ $p_M = 1.0$	$1.26
	Western Oregon & Western Washington Federal land		$5.90 (1 year)	$5.90			$5.90
	Eastern Oregon & Eastern Washington Federal land		$3.30 (1 year)	$3.30			$3.30
	No. California Federal land		$8.95 (1 year)	$8.95			$8.95
	So. California Federal land		$12.16 (1 year)	$12.16			$12.16
Livestock Grazing on Federal Land	Grazing	per acre	$29.00 (1 year)	$29.00	10 years	$p_t = 0.10$ $p_M = 1.0$	$2.90

Table D-36
Summary of Activity Cost Estimation

Activity	Sub-activity	Cost Unit	Cost Stream (Duration)	Present Value of Cost Stream	Forecast Period	Probability of Modifications	Annual Expected Per-Project Cost
Transportation**	Bridges & culverts (small)	per project & mile	$27,800 + variable costs (1 year)	$41,778	5 years	$p_t = 0.20$ $p_M = 1.0$	$8,356
	Bridges & culverts (medium)		$55,500 + variable costs (1 year)	$69,478			$13,896
	Bridges & culverts (large)		$84,300 + variable costs (1 year)	$98,278			$19,656
	Roads (small)	per project & mile	$22,800 + variable costs (1 year)	$36,778	5 years	$p_t = 0.20$ $p_M = 1.0$	$7,356
	Roads (medium)		$47,000 + variable costs (1 year)	$60,978			$12,196
	Roads (large)		$71,300 + variable costs (1 year)	$85,278			$17,056
Utility Lines	Outfall structures and pipelines	per project	$101,000 (1 year)	$101,000	8 years	$p_t = 0.125$ $p_M = 1.0$	$12,625
Instream Activities	Dredging	per project	$821,000 (1 year)	$821,000	Annual	$p_t = 1.0$ $p_M = 1.0$	$821,000

Table D-36
Summary of Activity Cost Estimation

Activity	Sub-activity	Cost Unit	Cost Stream (Duration)	Present Value of Cost Stream	Forecast Period	Probability of Modifications	Annual Expected Per-Project Cost
	Boat dock, boat ramps, bank stabilization	per project	$54,500 (1 year)	$54,500	Annual	$p_t = 1.0$ $p_M = 1.0$	$54,500
NPDES-permitted activities	Minor facility	per facility	O&M: $6,800 (20 years)	7%: $72,039 3%: $101,167	Immediate	$p_t = 1.0$ $p_M = 0.20$	$1,360
	Major facility	per facility	Capital: $421,500 O&M: $19,725 (20 years)	7%: $630,467 3%: $714,958	Immediate	$p_t = 1.0$ $p_M = 0.25$	7%: $14,878 3%: $12,104
Sand and Gravel Mining	Mining on non-Federal lands	per site	$330,000 (5 years)	7%: $1,353,065 3%: $1,511,303	30 years	$p_t = 0.033$ $p_M = 0.50$	7%: $22,551 3%: $25,188
Residential and Commercial Development	New development	per project	$235,000 (1 year)	$235,000	20 years	$p_t = 0.05$ $p_M = 1.0$	$11,750

*The cost stream presented is the present value of costs.
**Transportation costs are presented for a project of average mileage (3.2 miles).

Appendix E
Water Supply Impacts Related to Salmon and O. mykiss

As noted in Section 4, the impacts of section 7 on water supply activities cannot be analyzed on a watershed basis, as these activities often affect multiple watersheds simultaneously. Attributing the impacts of section 7 consultations and the resulting modifications to a particular watershed is not appropriate, then, as designating critical habitat or applying section 7 generally to *any* of those watersheds would bring about the same result. Nevertheless, assessing the potential magnitude of these impacts is important. Below, we summarize several studies that assess these magnitudes for the Pacific Northwest and California, although not in the context of critical habitat designation. We also describe major water supply projects in those states.

This appendix supports the analysis for both the 13 Pacific Northwest salmon and O. mykiss ESUs as well as the 7 California ESUs. For that reason, the appendix contains references to data and methods specific to California.

E 1. Review of Selected Literature

E 1.1 Economics Literature

1) Hamilton and Whittlesey (1996)

This paper examines costs associated with the NOAA Fisheries Recovery Plan for salmon species on the Snake/Columbia system. Costs are based on flow targets (as of the date of the study) for the lower Snake River at Lower Granite Dam in spring/early summer and midsummer. The paper develops five scenarios that cover a broad range of flow target interpretations.

Results indicate a range of annual costs to agriculture from $81 million to $292 million for proposed flow augmentation. The flow augmentation cost range is developed through estimation of agricultural land retirement and agricultural participation in an interruptible water market. Affected agricultural acreage ranges from approximately 25 percent of the total irrigated acres in the region to 18 percent more than the total irrigated acres in the region. Flow augmentation allows for increased power production that offsets the gross cost to agriculture. Net of increased electric power production revenues resulting from increased flow, the annual costs of flow augmentation to agriculture are estimated to be between $50 million and $160 million.

Caveats to the research include the consideration of willing sellers only, the assumption that interruptible markets would only deliver up to 600,000 acre feet in dry years, the exclusion of third party costs including water shortage costs to downstream irrigators (i.e., from changes in runoff or aquifer recharge), costs related to flow management facilities, legal costs, and secondary impacts. Nonetheless, the authors argue that costs are conservative for several reasons.

It should be noted that scenarios related to the NMFS recovery plan are outdated. Nonetheless, Hamilton and Whittlesey (1996) provides understanding of the magnitude of costs that may be attributable to future flow augmentation scenarios.

2) Huppert et al. (2004)

Huppert et al. (2004) examines the economic effect of increased water withdrawal from the mainstem of Columbia River in Washington. The analysis considers effects on agricultural production, municipal and industrial water supplies, hydropower generation, flood control, river navigation, commercial and recreational fishing, regional impacts, and passive use values. Five different "management scenarios" are evaluated. Though fisheries-related regulation is likely to decrease water withdrawal from the tributaries of the Columbia, this research provides useful dollar value estimates associated with specific changes in water availability. In this section, we examine the Huppert et al. (2004) estimates of agricultural and regional impacts.

The management scenarios evaluated in Huppert et al. (2004) research were developed by Washington's Department of Ecology. The scenarios prescribe variation in the quantity of new water rights, fees, contingencies, and other requirements. Table E-1 describes the five management scenarios.

Table E-1
Five Management Scenarios

Scenario	Quantity of New Water Rights	Fees	Contingencies	Other Requirements
I.	1 MAF	None	None	Meet BMPs and meter withdrawals
II.	1 MAF	$10/acre-foot annually	300 KAF (80% of existing rights complying with BMPs)	Meet BMPs and meter withdrawals
III.	1 MAF	$20/acre-foot annually	300 KAF (80% of existing rights complying with BMPs)	Meet BMPs and meter withdrawals
IV.	None	$30/acre-foot annually	New withdrawals must be fully offset by transfers, conservation, or new storage	Meet BMPs and meter withdrawals
V.	Status Quo	None	Issuance of new rights follows current procedures & depends upon opinion of fishery managers	

Huppert et al. (2004) shows that the irrigation agriculture sector is significantly affected by allocation of additional water rights from the Columbia mainstem. New water rights allow the expansion of crop production. The analysis assumes that crop prices remain at current levels, and that the costs of production are reflected in crop budget studies. The study reports that new agricultural production will generate between $349.0 and $752.9 million in gross revenue, which corresponds to between $52.1 and $136.5 million in net revenue, as shown in Table E-2.

Table E-2
Summary of Effects on Agricultural Production and Value

Scenario	Gross Revenue ($ millions)	Net Revenue ($ millions)
I.	$752.9	$136.5
II.	$476.2 - $752.9	$79.8 - $136.5
III.	$349.0 – $752.9	$52.1 – $136.5
IV.	Unknown	Unknown
V.	None	None

Regional economic impacts are determined using the 1987 Washington Input-Output model. First, Huppert et al. (2004) estimate direct impacts, which consist of increased sales of raw and processed agricultural products, then estimate full effects, which consider the total (multiplied) effect of the direct impacts on the economy as a whole. The estimated Output impact measures the change in sales of all products, including raw materials, wholesale products, plus a retail sales margin. In addition, the Input-Output model estimates employment and value-added impacts. Results of the regional economic analysis are presented in Table E-3.

Table E-3
Summary of Economic Impacts of Agricultural Section Expansion

Scenario	Total Output Impact $2002 (in millions)	Total Employment Impact	Total Value-Added Impact
1 MAF	$4244.580	44,656	$2,023.6
700 KAF	$2195.634	23,812	$1,059.4
569 KAF	$1,570.09	17,160	$759.6

E 1.2 Engineering Literature

1) USBR (1999)

The USBR (1999) Snake River Flow Augmentation analysis uses a hydrology model of the upper Snake to predict the impacts from water shortage, then uses economic modeling to estimate the related dollar value impacts.

On March 2, 1995, NOAA Fisheries issued a biological opinion on the operation of the FCRPS with respect to endangered Snake River spring/summer chinook salmon , Snake River fall chinook salmon, and Snake River sockeye salmon. This biological opinion concluded that the effects of the proposed operations of Federal hydroelectric dams in the Columbia and Snake River basins would jeopardize the continued existence of the listed Snake River salmon stocks. Flow augmentation in the lower Snake River and the Columbia River is a key component of the 1995 biological opinion. Reclamation agreed to provide 427,000 acre-feet of flow augmentation.

USBR (1999) analyzes the effects of providing a flow augmentation in the following scenarios:

I. Base Case: Provide 427,000 acre-feet of flow augmentation water each year.
II. No Augmentation: Provide no water for flow augmentation (condition prior to 1991).
III. Provide up to 1,427,000 acre-feet of flow augmentation water to meet deficits in flow targets at Lower Granite Dam. Irrigation shortages would be minimized by using large drawdowns of Reclamation reservoirs (i.e., storage reservoirs are operated to minimize the impact on irrigation).
IV. Provide up to 1,427,000 acre-feet of flow augmentation water to meet deficits in flow targets at Lower Granite Dam. Reservoir elevations would be maintained at or near the Base Case levels with shortages assumed by irrigation (i.e., storage reservoirs are operated to minimize the impact on recreation).

Changes in agricultural production, hydropower generation, and recreation due to the flow augmentation scenarios would have national and regional economic impacts. National economic impacts were identified for agriculture, hydropower, and recreation. Regional impacts were identified using input-output modeling (IMPLAN) for agriculture and recreation. National economic impacts on agriculture are provided in Table E-4, while regional economic impacts on agriculture attributable to flow augmentation are presented in Table E-5.

The national effects presented are direct effects (i.e., no multiplier effect is considered in the analysis). For agriculture, the direct effects are calculated using the value of production, or gross revenue, measured as the total production of an irrigated crop multiplied by its market value. A change in the value of production provides an estimate of the total direct loss in economic activity resulting from the prescribed water acquisition program. Water acquisition costs are calculated based on recent water acquisitions.

Table E-4 National Economic Effects on Agriculture (Direct Costs)*				
Item	**Scenario I**	**Scenario II**	**Scenario III**	**Scenario IV**
Decrease in irrigated acres in average water-year	0[1]	0	$243,000	$360,000
Decrease in irrigated acres in dry water-year	([2])	([2])	$376,000	$643,000
Decrease in value of production in average water-year	0[3]	0	$90,204,000	$136,433,000
Decrease in value of production in dry water-year	([2])	([2])	$141,202,000	$243,737,000
Water acquisition cost (annual) low estimate	0	0	$10,414,000	$31,128,000
Water acquisition cost (annual) high estimate	0	0	$31,243,000	$87,157,000

* Direct costs include lost value of production, not broader market adjustments.
[1] Base Case average irrigated acreage is 3,364,000 acres
[2] Not estimated
[3] Base Case average value of production is $2,019,934,000

The study estimates regional economic impacts in three ways:

1) Reduced Irrigation. This estimate is of impacts stemming from the reduction in irrigated agricultural production only;
2) Reduced Irrigation With Payments to Farmers. This estimate adds the impacts of a hypothetical water acquisition program to those of a reduction in irrigated agriculture production; and
3) Reduced Irrigation With Forward Linkages. This estimate adds the effect of forward linkages to those of a reduction in irrigated agriculture production. That is, it adds the ripple effects to industries such as livestock and agricultural processing that use irrigated crops as a part of their production process.

The study also states that the second estimate, Reduced Irrigated Agriculture Production With Water Payments, is the best estimate of regional economic impacts.

Table E-5 Regional Economic Effects on Agriculture				
Item	**Scenario I**	**Scenario II**	**Scenario III**	**Scenario IV**
Employment–jobs lost (annual)	0 [1]	0	2,543	3,612
Income lost (annual)	0 [2]	0	$44,700,000	$51,976,000
Sales lost (annual)	0 [3]	0	$95,200,000	$130,400,000
[1] Scenario I regional jobs total 658,543 [2] Scenario I regional income totals $23,310,023,000 [3] Scenario I regional sales total $46,777,512,000				

According to the 2001 biological opinion (U.S. Bureau of Reclamation Operations and Maintenance of its Projects in the Snake River Basin above Brownlee Dam from Date Issued through March 2002, 5/2/2001), USBR (1999) anticipated that the prescribed flow augmentation (427,000 acre-feet) would not be available in 2001 or similar dry years for a variety of reasons. The 2001 biological opinion states:

> *NMFS' expectations for flow augmentation for the long term acknowledge that in very low water years like 2001, the opportunities for significant flow augmentation volumes from the upper Snake River basin would be limited. When combined with the reductions in stream flow depletions anticipated by other water interests, the proposed action for 2001 will yield volumes of flow augmentation within the range expected by the USBR in a low water year such as this one.*

The terms and conditions of the 2001 biological opinion require that USBR work toward procurement of water in an effort to meet the prescribed 427,000 acre-foot flow augmentation. Specifically, prior to entering into any agreement to commit uncontracted storage space in any of its reservoirs covered by the 2001 biological opinion to any use other than salmon flow augmentation, the USBR shall consult under section 7. In addition, USBR shall seek out water savings programs, describe the potential outcome of such storage, and identify those programs with the highest potential for streamflow improvement in the event of future droughts.

In the context of the 2001 biological opinion, it seems unlikely that NOAA Fisheries will require a 300 percent increase in flow augmentation in the future (USBR (1999) models an additional one million acre feet of flow augmentation). According to the study:

> *It is important to recognize that the 1,427,000 acre-foot scenarios for this analysis are only conceptual, and therefore, the analysis is conceptual. In some cases, due to a lack of empirical data, estimations and assumptions were used in developing modeling simulations. The model results cannot precisely depict all future operations and circumstances. The implementation of an additional 1 million acre-feet of flow augmentation would, most certainly, have an affect that reaches far beyond the scope of this theoretical analysis (USBR 1999).*

The 1,427,000 acre foot augmentation cost estimates are useful, however, when interpreted as an extreme upper bound scenario.

2) California Water System Operations Environmental Funding

The California Bay-Delta Authority (CALFED), established by legislation enacted in 2002, provides a permanent governance structure for the collaborative California State-Federal water management effort that began in 1994. A key component of CALFED's Water Management Strategy, the Environmental Water Account (EWA) was created to address two problems, declining fish populations and unreliable water supplies. Its purpose is to better protect fish by making it possible to modify water project operations in the Bay-Delta and still meet the needs of water users.

The EWA buys water from willing sellers or diverts surplus water when safe for fish, then banks, stores, transfers and releases it as needed to protect fish and compensate water users. For example, EWA managers might coordinate with water project operators to curtail pumping at specific times to avoid harming fish, and then provide water to cities and farms to compensate for the reduced pumping.

The EWA does not provide all of the fish protection in the California water system. The regulatory baseline includes the biological opinions on winter-run salmon and delta smelt, the California State Water Control Board 1995 Delta Water Quality Control Plan, and 800,000 acre-feet of CVP water pursuant to the Central Valley Project Improvement Act (CVPIA).

EWA funding is representative of a portion of the costs associated with NOAA Fisheries' requirements related to operations of the CVP and SWP. In addition, the EWA funds additional recovery efforts above the regulatory baseline. EWA funding is presented in Table E-6.

Table E-6
Environmental Water Account Funding ($ in Millions)

Category	Program Year							Total
	2001	2002	2003	2004	2005	2006	2007	
Water & Power Acquisitions	$57.15	$31.48	$44.54	$40.40	$32.27			$205.84
Tier 3 Water			$6.25	$3.20				$9.45
Environmental Documen-tations	$1.39	$0.20	$0.25	$0.20	$0.20			$2.24
Oversight and Coordination	$0.36	$0.46	$0.36	$0.21	$0.06	$0.06	$0.06	$1.57

Table E-6 Environmental Water Account Funding ($ in Millions)								
Category	Program Year							Total
	2001	2002	2003	2004	2005	2006	2007	
Actual and Expected Funding	$58.90	$32.14	$51.40	$44.01	$32.53	$0.06	$0.06	$219.10
Funding for years 1-2 (2001-2002) reflects actual State encumbrances & expenditures and Federal obligations. Funding for Year 3 reflects final State and Federal budgets. Funding for Year 4 reflects proposed Governor's and President's budgets. Expected funding in Years 5-7 includes remaining state bond funds until spent and ongoing State base funding, plus estimates for local matching to grants for years where bond funding is available. Note: Federal appropriations for Years 5-7 is dependent on a decision to continue the EWA beyond Year 4.								

E 2. Description of Major Water Projects in Critical Habitat Areas[1]

E 2.1 California

California's Federal Water Project - The Central Valley Project (CVP)

The CVP extends 400 miles from the Cascade Range near Redding in northern California to the Tehachapi Mountains near Bakersfield in southern California. Initial features of the project were built primarily to protect the Central Valley from water shortages and flooding. The CVP also improves river navigation, supplies domestic and industrial water, generates electric power, conserves fish and wildlife, creates opportunities for recreation, and enhances water quality. The CVP serves farms, homes, and industry in California's Central Valley as well as major urban centers in the San Francisco Bay Area; it is also the primary source of water for much of California's wetlands.

The CVP consists of 20 dams and reservoirs, 11 powerplants, and 500 miles of major canals, as well as conduits, tunnels, and related facilities. CVP operators manage approximately nine million acre-feet of water annually, delivering about 7 million acre-feet of water for agricultural, urban, and wildlife use. The CVP provides roughly 5 million acre-feet for farms, 600,000 acre-feet for municipal and industrial use, 800,000 acre-feet per year to fish and wildlife, and 410,00 acre-feet to State and Federal wildlife refuges and wetlands. In addition, the CVP generates 5.6 billion kilowatt hours of electricity annually to meet the needs of about 2 million people.

California's State Water Project (SWP)

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1. This list includes all major projects in the CA, ID, OR and WA–some of these projects may fall outside of proposed critical habitat areas. This section is intended only to add context to the discussion above.

The California State Water Project extends for more than 600 miles from northern California to southern California. The main purpose of the SWP is water supply. In addition, the Project provides flood control, recreation, and water for fish and wildlife. The SWP stores water and distributes it to 29 urban and agricultural water suppliers in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California. Of the contracted water supply, 70 percent goes to urban users and 30 percent goes to agricultural users.

Today, the Project includes 32 storage facilities, reservoirs and lakes; 17 pumping plants; 3 pumping-generating plants; 5 hydroelectric power plants; and about 660 miles of open canals and pipelines. The Project provides supplemental water to approximately 20 million Californians and about 660,000 acres of irrigated farmland. The Project makes deliveries to two-thirds of California's population.

E 2.2 Idaho

The Avondale Project

Rehabilitation of privately developed irrigation facilities on the 880 acre Avondale Project by the Bureau of Reclamation in 1954-1955 required the reconstruction of a pumping plant at the source of supply, Hayden Lake, and the construction of an elevated equalizing tank with a main water line and distribution system for sprinkler irrigation. However, the water source is now four deep wells drilled by the Avondale Irrigation District in lieu of pumping from Hayden Lake. Farming is on a part-time basis and subdividing continues since this is a popular resort area which also offers industrial employment.

The Boise Project

Boise Project furnishes a full irrigation water supply to about 224,000 acres and a supplemental supply to some 173,000 acres under special and Warren Act contracts. The irrigable lands are in southwestern Idaho and eastern Oregon.

Principal facilities include five storage dams (excluding Lucky Peak Dam constructed by the Corps of Engineers and Hubbard Dam a re-regulatory facility) which form reservoirs with a total capacity of 1,793,600 acre-feet (active 1,663,200 acre-feet), two diversion dams, three powerplants with a combined capacity of 50,200 kilowatts, seven pumping plants, canals, laterals, and drains.

To facilitate organization of the administrative and operating procedures, the irrigable project lands are divided into the Arrowrock and Payette Divisions. Some of the features serve only one division; other features serve both divisions as well as other nearby projects.

The Dalton Gardens Project

Dalton Gardens is a privately developed project 2 miles north of Coeur d'Alene, Idaho, and 30 miles east of Spokane, Washington, on the eastern edge of the extensive Spokane Valley plain, known as Rathdrum Prairie. The project's irrigation works include a pumping plant, equalizing reservoir and main line, and a distribution system that has been reconstructed to supply approximately 980 acres of land with an adequate sprinkler irrigation water supply.

The Lewiston Orchards Project

Private interests originally constructed the Lewiston Orchards Project beginning in 1906. Most of the project features have been rehabilitated or rebuilt by the Bureau of Reclamation. The project facilities include four diversion structures (Webb Creek, Sweetwater, West Fork, and Captain John) feeder canals, three small storage reservoirs (Soldiers Meadow, Reservoir "A", and Lake Waha) a domestic water system including a water filtration plant that is no longer in use, and a system for distribution of irrigation water. The domestic water supply initially provided by surface water resources now comes entirely from groundwater resources developed by the Lewiston Orchards Irrigation District. A full irrigation water supply is delivered to project lands totaling over 3,900 acres, and a dependable domestic water system is now provided for some 16,000 residents.

The Little Wood River Project

Little Wood River Project includes lands within an area 2 miles wide and 12 miles long upstream and downstream from Carey, Idaho, in the south-central section of the State. The project provides a supplemental irrigation water supply for approximately 9,550 acres of land. The principal construction feature is the enlarged Little Wood River Dam and Reservoir that serve previously constructed diversion and distribution works. Flood control is provided by operation of the reservoir on a forecast basis.

The Mann Creek Project

The Mann Creek Project in west-central Idaho consists of approximately 5,100 irrigable acres utilizing an existing distribution system in the narrow valleys of Mann and Monroe Creeks, both tributaries of the Weiser River. The natural flow of Mann Creek historically has been near its lowest point during the growing season when the demand for irrigation water is at its highest. Project development provides for storage of winter and spring flows of Mann Creek for use later in the irrigation season.

The Michaud Flats Project

The Michaud Flats Project provides irrigation for some 11,200 acres along the Snake River adjacent to the town of American Falls in southeastern Idaho. Surface flow of the Snake River, stored in space allotted to the project in American Falls (Minidoka Project) and Palisades (Palisades Project) Reservoirs, is pumped from below American Falls Reservoir into canals that serve 69 percent of the land. Return flow is used on as much of the land as it will serve, and ground water is pumped from wells to serve the remainder. The project area is part of 65 square miles of flat rolling land south of the Snake River between Pocatello and Eagle Rock known as the Michaud Flats. Irrigable land on the flats is divided by the western boundary of the Fort Hall Indian Reservation into a Michaud Flats extension of the Fort Hall Indian Project and the Michaud Flats Project.

The Minidoka Project

Minidoka Project lands extend discontinuously from the town of Ashton, in eastern Idaho along the Snake River, about 300 miles downstream to the town of Bliss in south-central Idaho. The project furnishes irrigation water from five reservoirs that have a combined active storage capacity of more than 3 million acre-feet.

The project works consist of Minidoka Dam and Powerplant and Lake Walcott, Jackson Lake Dam and Jackson Lake, American Falls Dam and Reservoir, Island Park Dam and Reservoir, Grassy Lake Dam and Grassy Lake, two diversion dams, canals, laterals, drains, and some 177 water supply wells.

The Owyhee Project

The Owyhee Project lies west of the Snake River in Malheur County, Oregon, and Owyhee County, Idaho. The project furnishes a full irrigation water supply to over 105,000 acres of land lying along the west side of the Snake River in eastern Oregon and southwestern Idaho. An additional 13,000 acres are furnished supplemental water. About 72 percent of the lands are in Oregon, and 28 percent in Idaho. Irrigable lands are divided into the Mitchell Butte, Dead Ox Flat, and Succor Creek Divisions. The key feature of the project is Owyhee Dam, on the Owyhee River about 11 miles southwest of Adrian, Oregon, which acts as both a storage and diversion structure. Project works also include canals, pipelines, tunnels, 9 pumping plants, laterals and drains.

The Palisades Project

The principal features of the project are Palisades Dam Reservoir, and Powerplant. Palisades Dam is on the South Fork of the Snake River at Calamity Point in eastern Idaho about 11 miles west of the Idaho-Wyoming boundary. The project provides a supplemental water supply to about 650,000 acres of irrigated land in the Minidoka and Michaud Flats Projects. The 176,600 kilowatt hydroelectric powerplant furnishes energy needed in the upper valley to serve irrigation pumping units, municipalities, rural cooperatives, and other power users. The principal features of the project are Palisades Dam, Reservoir, and Powerplant.

The Preston Bench Project

The Preston Bench Project, located in southeastern Idaho near the town of Preston, includes Mink Creek Canal which supplies irrigation water for 5,000 acres of highly developed land in the vicinity of Preston.

The Rathdrum Prairie Project

The Rathdrum Prairie Project area extends about 12 miles north and 13 miles west of Coeur d'Alene in the panhandle of Idaho. The initial project consisted of the Post Falls, Hayden Lake, and East Greenacres Units, totaling about 10,200 acres of irrigable land. However, in 1991, the landowners within the Post Falls Unit petitioned for dissolution of the operating entity, the Post Falls Irrigation District. By 1995, with approval of the Bureau of Reclamation, dissolution activities were completed. Currently there are about 7,000 irrigable acres in the Rathdrum Prairie Project.

Major facilities of the Post Falls Unit consisted of a pumping plant, 3,000 feet of discharge pipe, 9 miles of canal, and 20 miles of laterals.

Hayden Lake facilities consisted of a pumping plant, 2 miles of 27-inch-diameter discharge pipe, a 10,026-cubic foot storage tank, and a pipe distribution system. However, the Hayden Lake Irrigation District has since converted to a groundwater supply.

Primary facilities of the East Greenacres Unit include 14 wells in 3 well complexes, a 43,446 cubic-foot regulating reservoir, and a pipe distribution system.

The Ririe Project

The Ririe Project was constructed to impound and control the waters of Willow Creek, a Snake River tributary in eastern Idaho, for flood control, irrigation, and recreation. Significant fish and wildlife protection measures also are included. Major features include Ririe Dam and Lake, and a floodway bypass outlet channel.

The Spokane Valley Project

The Spokane Valley Project provides an irrigation and domestic water supply for lands lying east of the city of Spokane, extending eastward to the Washington-Idaho boundary and on into Idaho for a short distance. The diversion dam on the Spokane River and the canal system previously used were abandoned in 1967 favor of a pumping system from wells into a pressure pipeline system that now provides sprinkler irrigation and serves domestic, municipal, and industrial requirements.

E 2.3 Oregon

The Arnold Project

The Arnold Project, a private development southeast of Bend, Oregon, diverts water from the Deschutes River a short distance above Lava Island Falls for approximately 4,300 acres of irrigable land. Project features include Arnold Diversion Dam, Arnold Flume and Canal, and laterals.

The Baker Project

The Baker Project in east-central Oregon consists of two divisions, the Lower and the Upper. The Lower Division provides a supplemental water supply for about 7,300 acres along the Powder River about 10 miles northeast of Baker, Oregon. The Upper Division provides supplemental water for 19,000 acres, including some contiguous areas previously dry-farmed near the city of Baker.

The Burnt River Project

The Burnt River Project in east-central Oregon consists of a storage dam and reservoir that provides water for supplemental irrigation of some 15,600 acres which formerly depended entirely on the natural flow of the Burnt River.

The Crescent Lake Dam Project

The Crescent Lake Dam Project is composed of lands of the Tumalo Irrigation District on the west side of the Deschutes River near Bend, Oregon. The principal feature of the project is Crescent Lake Dam, located at the outlet of Crescent Lake. The lake is a large natural body of water formed in a glacial deposit high on the eastern slopes of the Cascade Range. Canals, pipelines, and distribution laterals in the project furnish a full irrigation water supply to over 8,000 acres of land. Developed by private interests, various project facilities have been rehabilitated by or through the assistance of the Bureau of Reclamation.

The Crooked River Project

The main body of the Crooked River Project lies north and west of Prineville, Oregon. The water resources of Ochoco Creek and Crooked River are used to furnish irrigation water for approximately 20,000 acres. Project features include Arthur R. Bowman Dam on the Crooked River, Ochoco Dam on Ochoco Creek, a diversion canal and headworks on the Crooked River, Lytle Creek Diversion Dam and Wasteway, two major pumping plants, nine small pumping plants, and Ochoco Main and distribution canals.

The Dalles Project

The Dalles Project, Western Division is located about 80 miles east of Portland, adjacent to the city of The Dalles, Oregon, on the south side of the Columbia River. Principal features are the Mill Creek Pumping Plant, a booster pumping plant, seven relift pumping plants, three concrete-lined reservoirs, one elevated steel storage tank, five steel regulating tanks, and 46 miles of buried pressure pipe. The division provides water for nearly 6,000 irrigable acres of land.

The Deschutes Project

The Deschutes Project lands are in the vicinity of Madras, Oregon. Principal features include Wickiup Dam and Reservoir, Crane Prairie Dam and Reservoir, Haystack Dam and Reservoir, North Unit Main Canal and lateral system, and the Crooked River Pumping Plant. The project furnishes a full supply of irrigation water for about 50,000 acres of land within the North Unit Irrigation District, and a supplemental supply for more than 48,000 acres in the Central Oregon Irrigation District and Crook County Improvement District No. 1.

The Grants Pass Project

The Grants Pass Project lies within the Rogue River Basin in southwestern Oregon. The project was constructed by private interests beginning in the 1920's and partially rehabilitated by the Bureau of Reclamation in 1949-1955. The project furnishes irrigation water to over 10,000 acres of land surrounding the town of Grants Pass, Oregon. Principal project features are the Savage Rapids Diversion Dam on the Rogue River, and the associated pipelines, pumping plants, canals, and laterals.

The Klamath Project[2]

The irrigable lands of the Klamath Project are in south-central Oregon (62 percent) and north-central California (38 percent). The Project provides full service water to approximately 240,000 acres of cropland. Two main sources supply water for the project: Upper Klamath Lake and the Klamath River; and Clear Lake Reservoir, Gerber Reservoir, and Lost River, which are located in a closed basin. The total drainage area, including the Lost River and the Klamath River watershed above Keno, Oregon, is approximately 5,700 square miles.

The Owyhee Project

The Owyhee Project lies west of the Snake River in Malheur County, Oregon, and Owyhee County, Idaho. The project furnishes a full irrigation water supply to over 105,000 acres of land lying along

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2. The re-assessment of critical habitat is not occurring within the area of this project.

the west side of the Snake River in eastern Oregon and southwestern Idaho. An additional 13,000 acres are furnished supplemental water. About 72 percent of the lands are in Oregon, and 28 percent in Idaho. Irrigable lands are divided into the Mitchell Butte, Dead Ox Flat, and Succor Creek Divisions. The key feature of the project is Owyhee Dam, on the Owyhee River about 11 miles southwest of Adrian, Oregon, which acts as both a storage and diversion structure. Project works also include canals, pipelines, tunnels, 9 pumping plants, laterals and drains.

The Rogue River Basin Project

The Talent Division of the Rogue River Basin Project is in the northeastern part of the Rogue River Basin in southwestern Oregon. Work on the division consisted of construction, rehabilitation, and improvement of the irrigation facilities of three irrigation districts in the vicinity of Medford, Oregon, and the provision for full and supplemental water for these lands. The work on the Medford and Rogue River Valley Irrigation Districts included rehabilitation and betterment of Fourmile Lake Dam, Fish Lake Dam, and the numerous structures which are a part of the Main and Medford Canals. An extensive collection, diversion, storage, and conveyance system was constructed to carry excess waters of the Rogue River and Klamath River Basins to the irrigated lands.

The Talent Irrigation District consists of approximately 15,500 irrigable acres. Medford Irrigation District has a water supply for 11,500 acres, and Rogue River Valley Irrigation District has a water supply for 8,300 acres. Additionally, the Talent Division provides electric power from a 16,000-kilowatt hydroelectric Green Springs Powerplant.

Principal features of the Talent Division include Howard Prairie Dam, Howard Prairie Delivery Canal, Keene Creek Dam, Green Springs Powerplant, the enlarged Emigrant Dam and Lake, and Agate Dam and Reservoir.

The Tualatin Project

The Tualatin Project area lies primarily in Washington County in the northwest part of the Willamette Basin, west of and adjacent to the city of Portland, Oregon. Some 17,000 acres of land are furnished irrigation water. Several communities and an industrial corporation are furnished untreated water for municipal and industrial use, and for quality control purposes. Fish and wildlife enhancement, recreation, and flood control are also important project functions.

Principal features include Scoggins Dam, Henry Hagg Lake, Patton Valley Pumping Plant, Spring Hill Pumping Plant, booster pumping plants, and piped lateral distribution systems.

The Umatilla Project

The original Umatilla Project furnishes a full supply of irrigation water to over 17,000 acres and a supplemental supply to approximately 13,000 acres. These lands, located in north-central Oregon, are divided into three divisions. The East Division is the Hermiston Irrigation District, the West Division is the West Extension Irrigation District, and the South Division includes the Stanfield and Westland Irrigation Districts. In addition, there are approximately 3,800 acres not included in an irrigation district that are provided either a full or supplemental water supply from McKay Reservoir under individual storage contracts.

Project features of the East Division are Cold Springs Dam and Reservoir, Feed Canal Diversion Dam and Canal, and Maxwell Diversion Dam and Canal. Three Mile Falls Diversion Dam on the Umatilla River and the 27-mile West Extension Main Canal are the principal features of the West Division. McKay Dam and Reservoir are the only features in the South Division.

Activities were initiated in the mid-1980´s under the Umatilla Basin Project to restore instream flows for anadromous fish and allow established irrigation to continue. These activities resulted in Umatilla River channel modifications, construction of fish ladders, fish traps and fish screens, and the construction of water exchange facilities (Phase I and Phase II) to deliver irrigation replacement water from the Columbia River.

The Vale Project

The Vale Project lands are located along the Malheur River and Willow Creek in east-central Oregon, surrounding the town of Vale. The project furnishes irrigation water to 35,000 acres of land. Features include Agency Valley Dam and Beulah Reservoir, Bully Creek Dam and Reservoir, Harper Diversion Dam, Vale Main Canal, and a distribution and drainage system. To supplement project needs, the Federal Government purchased one-half of the storage rights in the Warm Springs Reservoir built by the Warmsprings Irrigation District.

The Wapinita Project

The Wapinitia Project, Juniper Division, is on Juniper Flat in north-central Oregon. Juniper Flat is a plateau, 3 to 6 miles wide and approximately 17 miles long, between the Deschutes and White Rivers. Some 2,100 acres over a scattered area receive supplemental irrigation service from the project. The principal construction feature is Wasco Dam on Clear Creek, 0.5 mile below the outlet of Clear Lake, a natural lake in a mountain valley.

E 2.4 Washington

The Chief Joseph Project

The Chief Joseph Dam is on the Columbia River in north-central Washington and is a key structure in the comprehensive development of the Columbia River Basin. Storage water from the reservoir, and power revenues to assist in paying for irrigation features, are necessary for present and future irrigation development of the area.

The Columbia Basin Project

The Columbia Basin Project is a multipurpose development utilizing a portion of the resources of the Columbia River in the central part of the State of Washington. The key structure, Grand Coulee Dam, is on the main stem of the Columbia River about 90 miles west of Spokane, Washington. The extensive irrigation works extend southward on the Columbia Plateau 125 miles to the vicinity of Pasco, Washington, where the Snake and Columbia Rivers join.

Principal project features include Grand Coulee Dam, Franklin D. Roosevelt Lake, Grand Coulee Powerplant Complex, switchyards, and a pump-generating plant. Primary irrigation facilities are the Feeder Canal, Banks Lake, the Main, West, East High, and East Low Canals, O'Sullivan Dam,

Potholes Reservoir, and Potholes Canal. There is over 300 miles of main canals, about 2,000 miles of laterals, and 3,500 miles of drains and wasteways on the project.

The project irrigation facilities were planned to deliver a full water supply to about 1.1 million acres of land previously used only for dry farming or grazing. About 671,000 acres are currently irrigated and further development is not anticipated. Power production facilities at Grand Coulee Dam are among the largest in the world; the total name plate generating capacity is rated at 6,809 megawatts.

The Okanogan Project

Project facilities include Conconully Dam and Reservoir, Salmon Lake Dam and Conconully Lake, Salmon Creek Diversion Dam, and canals and laterals to serve some 5,000 acres of irrigable lands along the Okanogan River in the vicinity of Okanogan, Washington.

The Spokane Valley Project

The Spokane Valley Project provides an irrigation and domestic water supply for lands lying east of the city of Spokane, extending eastward to the Washington-Idaho boundary and on into Idaho for a short distance. The diversion dam on the Spokane River and the canal system previously used were abandoned in 1967 favor of a pumping system from wells into a pressure pipeline system that now provides sprinkler irrigation and serves domestic, municipal, and industrial requirements.

The Yakima Project

The Yakima Project provides irrigation water for a comparatively narrow strip of fertile land that extends for 175 miles on both sides of the Yakima River in south-central Washington. The irrigable lands presently being served total approximately 464,000 acres.

There are seven divisions in the project: Storage, Kittitas, Tieton, Sunnyside, Roza, Kennewick, and Wapato. The Wapato Division is operated by the Bureau of Indian Affairs, but receives most of its water supply from the Yakima Project for irrigation of 136,000 acres of land. Over 45,000 acres not included in the seven divisions are irrigated by private interests under water supply contracts with the Bureau of Reclamation. Storage dams and reservoirs on the project are Bumping Lake, Clear Creek, Tieton, Cle Elum, Kachess, and Keechelus. Other project features are 5 diversion dams, canals, laterals, pumping plants, drains, 2 powerplants, and transmission lines.

Appendix F.1
Annual Total Impact by Watershed

Puget Sound chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$306,869	$309,733	$810,889	$813,753	$1,314,909	$1,317,773
1711000202	$382,905	$382,905	$840,012	$840,012	$1,297,118	$1,297,118
1711000204	$261,546	$264,410	$569,755	$572,619	$877,964	$880,828
1711000401	$403,583	$403,583	$694,920	$694,920	$986,256	$986,256
1711000402	$121,495	$121,495	$215,199	$215,199	$308,904	$308,904
1711000403	$129,709	$129,709	$237,191	$237,191	$344,672	$344,672
1711000404	$94,308	$94,308	$149,688	$149,688	$205,068	$205,068
1711000405	$319,515	$322,379	$628,890	$631,754	$938,266	$941,130
1711000504	$2,751,517	$1,982,829	$2,773,992	$2,005,304	$2,796,466	$2,027,779
1711000505	$128,095	$128,095	$216,523	$216,523	$304,951	$304,951
1711000506	$258,009	$258,009	$476,119	$476,119	$694,228	$694,228
1711000507	$190,717	$190,717	$364,769	$364,769	$538,821	$538,821
1711000508	$4,290,977	$6,081,417	$4,602,093	$6,392,533	$4,913,208	$6,703,649
1711000601	$551,443	$551,443	$990,953	$990,953	$1,430,463	$1,430,463
1711000602	$374,211	$374,211	$706,537	$706,537	$1,038,864	$1,038,864
1711000603	$306,014	$306,014	$558,017	$558,017	$810,020	$810,020
1711000604	$197,345	$197,345	$383,201	$383,201	$569,058	$569,058
1711000701	$208,064	$208,064	$714,850	$714,850	$1,221,636	$1,221,636
1711000702	$318,241	$321,105	$728,444	$731,308	$1,138,647	$1,141,511
1711000801	$338,192	$338,192	$620,053	$620,053	$901,915	$901,915
1711000802	$325,125	$325,125	$643,821	$643,821	$962,518	$962,518
1711000803	$169,614	$169,614	$354,837	$354,837	$540,059	$540,059
1711000901	$597,485	$597,485	$1,038,918	$1,038,918	$1,480,352	$1,480,352
1711000902	$576,128	$576,128	$993,494	$993,494	$1,410,859	$1,410,859
1711000903	$106,752	$106,752	$204,428	$204,428	$302,103	$302,103
1711000904	$2,102,602	$2,556,546	$2,285,108	$2,739,052	$2,467,614	$2,921,558
1711000905	$199,823	$199,823	$255,115	$255,115	$310,408	$310,408
1711001003	$2,159,348	$3,194,833	$2,540,091	$3,575,576	$2,920,834	$3,956,320
1711001004	$245,264	$217,417	$429,329	$401,483	$613,395	$585,548
1711001101	$119,655	$119,655	$202,805	$202,805	$285,955	$285,955
1711001102	$654,853	$657,716	$1,371,095	$1,373,959	$2,087,337	$2,090,201
1711001201	$2,935,104	$4,434,821	$3,522,999	$5,022,716	$4,110,894	$5,610,612
1711001202	$894,752	$894,752	$1,967,701	$1,967,701	$3,040,650	$3,040,650
1711001203	$7,071,925	$7,071,925	$15,221,609	$15,221,609	$23,371,294	$23,371,294
1711001204	$940,751	$940,751	$2,003,482	$2,003,482	$3,066,212	$3,066,212
1711001301	$102,796	$102,796	$195,944	$195,944	$289,093	$289,093

Puget Sound chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$54,555	$54,555	$194,614	$194,614	$334,673	$334,673
1711001303	$1,064,294	$1,067,158	$2,578,104	$2,580,968	$4,091,914	$4,094,778
1711001401	$282,223	$282,223	$540,164	$540,164	$798,105	$798,105
1711001402	$1,055,460	$765,018	$1,876,882	$1,586,441	$2,698,305	$2,407,864
1711001403	$120,245	$120,245	$236,427	$236,427	$352,609	$352,609
1711001404	$1,663,699	$2,582,212	$1,825,383	$2,743,897	$1,987,068	$2,905,581
1711001405	$658,566	$672,885	$1,368,932	$1,383,251	$2,079,297	$2,093,616
1711001502	$114,251	$114,251	$250,927	$250,927	$387,603	$387,603
1711001503	$125,947	$125,947	$396,834	$396,834	$667,720	$667,720
1711001601	$98,468	$98,468	$343,269	$343,269	$588,070	$588,070
1711001602	$40,770	$43,634	$170,557	$173,421	$300,343	$303,207
1711001701	$746,109	$746,109	$993,841	$993,841	$1,241,573	$1,241,573
1711001802	$53,596	$53,596	$109,309	$109,309	$165,022	$165,022
1711001803	$126,704	$126,704	$243,866	$243,866	$361,028	$361,028
1711001804	$47,936	$47,936	$91,747	$91,747	$135,559	$135,559
1711001805	$76,903	$76,903	$137,500	$137,500	$198,096	$198,096
1711001806	$129,425	$129,425	$252,478	$252,478	$375,530	$375,530
1711001808	$199,599	$199,599	$596,887	$596,887	$994,175	$994,175
1711001900	$231,092	$231,092	$675,254	$675,254	$1,119,416	$1,119,416
1711001901	$962,931	$971,523	$2,432,071	$2,440,663	$3,901,211	$3,909,802
1711001902	$195,740	$195,740	$535,918	$535,918	$876,097	$876,097
1711001904	$770,849	$773,712	$1,766,183	$1,769,047	$2,761,518	$2,764,381
1711002003	$171,091	$171,091	$409,701	$409,701	$648,311	$648,311
1711002004	$192,021	$194,885	$496,956	$499,820	$801,891	$804,755
1711002007	$3,298,096	$3,298,096	$3,336,560	$3,336,560	$3,375,024	$3,375,024
N01	$665,875	$665,875	$1,557,434	$1,557,434	$2,448,994	$2,448,994
N02	$781,250	$781,250	$1,619,455	$1,619,455	$2,457,660	$2,457,660
N03	$678,500	$678,500	$1,467,200	$1,467,200	$2,255,900	$2,255,900
N04	$0	$0	$1,360	$1,360	$2,720	$2,720
N05	$348,150	$348,150	$780,014	$780,014	$1,211,879	$1,211,879
N06	$401,168	$404,032	$853,947	$856,811	$1,306,725	$1,309,589
N07	$367,320	$367,320	$873,598	$873,598	$1,379,875	$1,379,875
N08	$699,000	$699,000	$1,572,940	$1,572,940	$2,446,880	$2,446,880
N09	$655,630	$658,494	$1,437,619	$1,440,483	$2,219,608	$2,222,472
N10	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
N11	$113,400	$113,400	$248,889	$248,889	$384,379	$384,379
N12	$301,870	$301,870	$610,418	$610,418	$918,965	$918,965
N13	$112,500	$112,500	$247,970	$247,970	$383,440	$383,440
N14	$1,542,020	$1,542,020	$3,348,092	$3,348,092	$5,154,164	$5,154,164
N15	$313,290	$313,290	$958,049	$958,049	$1,602,809	$1,602,809

Puget Sound chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$156,250	$156,250	$340,625	$340,625	$525,000	$525,000
N17	$44,477	$44,477	$116,754	$116,754	$189,031	$189,031
N18	$653,500	$653,500	$1,452,160	$1,452,160	$2,250,820	$2,250,820
N19	$383,000	$383,000	$835,440	$835,440	$1,287,880	$1,287,880

Lower Columbia River chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$270,833	$270,833	$580,791	$580,791	$890,750	$890,750
1707010507	$167,623	$167,623	$291,752	$291,752	$415,882	$415,882
1707010508	$879,033	$1,259,509	$939,623	$1,320,099	$1,000,213	$1,380,689
1707010509	$1,259,327	$1,899,042	$1,601,128	$2,240,843	$1,942,930	$2,582,645
1707010510	$303,149	$303,149	$592,140	$592,140	$881,132	$881,132
1707010511	$395,158	$395,158	$797,808	$797,808	$1,200,458	$1,200,458
1707010512	$103,903	$103,903	$211,237	$211,237	$318,570	$318,570
1707010513	$171,313	$171,313	$343,609	$343,609	$515,905	$515,905
1708000101	$211,825	$211,825	$417,157	$417,157	$622,489	$622,489
1708000102	$127,371	$127,371	$231,720	$231,720	$336,069	$336,069
1708000103	$94,719	$94,719	$181,289	$181,289	$267,859	$267,859
1708000104	$61,923	$61,923	$158,331	$158,331	$254,738	$254,738
1708000105	$1,720,356	$1,578,607	$2,045,295	$1,903,546	$2,370,233	$2,228,485
1708000106	$139,115	$141,979	$371,139	$374,003	$603,164	$606,028
1708000107	$429,293	$429,293	$840,460	$840,460	$1,251,628	$1,251,628
1708000108	$51,075	$53,939	$175,403	$178,267	$299,731	$302,595
1708000109	$1,820,008	$1,834,327	$3,904,144	$3,918,463	$5,988,281	$6,002,599
1708000205	$471,095	$471,095	$825,934	$825,934	$1,180,773	$1,180,773
1708000206	$260,290	$262,788	$547,174	$549,672	$834,058	$836,556
1708000301	$305,071	$307,935	$571,406	$574,269	$837,741	$840,604
1708000302	$34,849	$40,576	$103,701	$109,429	$172,554	$178,282
1708000303	$14,668	$14,668	$34,120	$34,120	$53,573	$53,573
1708000304	$922,131	$927,858	$2,126,712	$2,132,440	$3,331,294	$3,337,022
1708000305	$112,500	$112,500	$249,330	$249,330	$386,160	$386,160
1708000306	$18,099	$20,963	$61,031	$63,895	$103,963	$106,826
1708000401	$230,643	$230,643	$431,738	$431,738	$632,832	$632,832
1708000402	$2,413,913	$2,981,652	$2,694,275	$3,262,014	$2,974,637	$3,542,375
1708000403	$293,944	$293,944	$554,664	$554,664	$815,384	$815,384
1708000404	$499,115	$499,115	$937,266	$937,266	$1,375,418	$1,375,418
1708000405	$366,626	$366,626	$706,699	$706,699	$1,046,772	$1,046,772

Lower Columbia River chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$105,147	$105,147	$187,398	$187,398	$269,650	$269,650
1708000502	$1,399,086	$516,811	$1,551,746	$669,471	$1,704,407	$822,131
1708000503	$227,420	$227,420	$592,113	$592,113	$956,805	$956,805
1708000504	$136,315	$136,315	$364,630	$364,630	$592,945	$592,945
1708000505	$59,412	$59,412	$113,712	$113,712	$168,012	$168,012
1708000506	$26,412	$26,412	$50,552	$50,552	$74,692	$74,692
1708000507	$171,547	$171,547	$370,319	$370,319	$569,091	$569,091
1708000508	$195,740	$195,740	$394,835	$394,835	$593,930	$593,930
1708000601	$245,798	$245,798	$721,466	$721,466	$1,197,133	$1,197,133
1708000602	$30,500	$33,364	$211,213	$214,077	$391,927	$394,790
1708000603	$12,745	$12,745	$52,549	$52,549	$92,353	$92,353
1709000704	$371,985	$450,285	$507,257	$585,557	$642,528	$720,828
1709001105	$66,543	$66,543	$165,156	$165,156	$263,769	$263,769
1709001106	$618,423	$769,831	$870,896	$1,022,304	$1,123,370	$1,274,778
1709001201	$291,531	$300,123	$588,956	$597,547	$886,380	$894,972
1709001202	$275,817	$278,681	$587,388	$590,252	$898,959	$901,823
1709001203	$1,391,244	$1,405,563	$3,358,206	$3,372,525	$5,325,168	$5,339,487

Upper Willamette River chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$314,524	$314,524	$601,988	$601,988	$889,452	$889,452
1709000102	$111,942	$111,942	$214,253	$214,253	$316,564	$316,564
1709000103	$240,459	$240,459	$443,294	$443,294	$646,129	$646,129
1709000104	$249,727	$249,727	$581,092	$581,092	$912,458	$912,458
1709000105	$272,912	$272,912	$544,448	$544,448	$815,985	$815,985
1709000106	$468,462	$468,462	$888,376	$888,376	$1,308,290	$1,308,290
1709000107	$179,978	$179,978	$347,947	$347,947	$515,917	$515,917
1709000108	$26,394	$26,394	$50,516	$50,516	$74,639	$74,639
1709000109	$306,125	$306,125	$689,640	$689,640	$1,073,155	$1,073,155
1709000110	$16,633	$16,633	$44,478	$44,478	$72,322	$72,322
1709000201	$332,505	$332,505	$742,247	$742,247	$1,151,988	$1,151,988
1709000202	$52,021	$52,021	$109,938	$109,938	$167,856	$167,856
1709000203	$87,935	$90,799	$281,253	$284,117	$474,571	$477,435
1709000205	$52,458	$52,458	$86,352	$86,352	$120,245	$120,245
1709000301	$90,007	$90,007	$470,267	$470,267	$850,527	$850,527
1709000302	$292,885	$301,476	$615,976	$624,567	$939,067	$947,658
1709000303	$69,133	$69,133	$110,336	$110,336	$151,539	$151,539

Upper Willamette River chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$160,861	$172,316	$202,546	$214,002	$244,231	$255,687
1709000305	$192,653	$195,517	$322,143	$325,007	$451,633	$454,497
1709000306	$38,195	$38,195	$160,430	$160,430	$282,664	$282,664
1709000401	$3,112,559	$4,004,503	$3,741,458	$4,633,402	$4,370,357	$5,262,301
1709000402	$308,513	$308,513	$590,482	$590,482	$872,451	$872,451
1709000403	$408,302	$408,302	$771,261	$771,261	$1,134,219	$1,134,219
1709000404	$162,887	$162,887	$415,487	$415,487	$668,088	$668,088
1709000405	$67,259	$67,259	$128,730	$128,730	$190,202	$190,202
1709000406	$90,087	$90,087	$166,052	$166,052	$242,017	$242,017
1709000407	$311,751	$233,571	$436,937	$358,757	$562,124	$483,944
1709000504	$22,907	$22,907	$56,486	$56,486	$90,065	$90,065
1709000505	$151,918	$151,918	$290,765	$290,765	$429,613	$429,613
1709000506	$76,677	$79,541	$117,056	$119,919	$157,434	$160,298
1709000601	$73,635	$79,363	$122,403	$128,131	$171,172	$176,899
1709000602	$64,899	$64,899	$115,915	$115,915	$166,931	$166,931
1709000603	$41,147	$41,147	$90,510	$90,510	$139,873	$139,873
1709000606	$220,072	$220,072	$412,878	$412,878	$605,685	$605,685
1709000607	$1,389	$1,389	$4,019	$4,019	$6,648	$6,648
1709000608	$9,606	$9,606	$31,478	$31,478	$53,350	$53,350
1709000701	$312,252	$312,252	$695,124	$695,124	$1,077,996	$1,077,996
1709000702	$53,587	$56,451	$258,764	$261,628	$463,941	$466,805
1709000703	$155,331	$163,922	$357,295	$365,887	$559,260	$567,851
1709000704	$371,985	$450,285	$507,257	$585,557	$642,528	$720,828
1709000804	$24,352	$24,352	$85,193	$85,193	$146,034	$146,034
1709000805	$4,293	$4,293	$175,103	$175,103	$345,912	$345,912
1709000806	$43,341	$43,341	$276,770	$276,770	$510,198	$510,198
1709000807	$27,158	$30,022	$128,790	$131,653	$230,421	$233,285
1709000901	$277,825	$280,688	$770,722	$773,586	$1,263,620	$1,266,484
1709000902	$20,625	$23,489	$78,302	$81,165	$135,978	$138,842
1709000903	$9,921	$9,921	$91,457	$91,457	$172,993	$172,993
1709000904	$9,591	$9,591	$85,852	$85,852	$162,114	$162,114
1709000905	$116,033	$116,033	$221,513	$221,513	$326,994	$326,994
1709000906	$22,227	$22,227	$111,254	$111,254	$200,281	$200,281
1709001101	$300,825	$300,825	$575,164	$575,164	$849,503	$849,503
1709001102	$291,221	$291,221	$557,390	$557,390	$823,559	$823,559
1709001103	$860,446	$968,468	$1,079,607	$1,187,629	$1,298,768	$1,406,790
1709001104	$1,855,632	$2,551,084	$2,223,748	$2,919,200	$2,591,864	$3,287,316
1709001105	$66,543	$66,543	$165,156	$165,156	$263,769	$263,769
1709001106	$618,423	$769,831	$870,896	$1,022,304	$1,123,370	$1,274,778
1709001201	$291,531	$300,123	$588,956	$597,547	$886,380	$894,972

Upper Willamette River chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$1,391,244	$1,405,563	$3,358,206	$3,372,525	$5,325,168	$5,339,487

Upper Columbia River spring-run chinook salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$164,396	$164,396	$375,689	$375,689	$586,981	$586,981
1702000801	$173,793	$173,793	$354,033	$354,033	$534,272	$534,272
1702000802	$212,200	$212,200	$425,784	$425,784	$639,369	$639,369
1702000803	$232,171	$232,171	$472,951	$472,951	$713,730	$713,730
1702000804	$302,675	$302,675	$631,859	$631,859	$961,042	$961,042
1702000805	$248,609	$248,609	$534,866	$534,866	$821,123	$821,123
1702000806	$425,383	$425,383	$1,022,852	$1,022,852	$1,620,320	$1,620,320
1702000807	$290,447	$290,447	$607,640	$607,640	$924,833	$924,833
1702001001	$722,122	$722,122	$1,389,403	$1,389,403	$2,056,683	$2,056,683
1702001002	$1,076,986	$1,082,713	$2,605,867	$2,611,595	$4,134,749	$4,140,477
1702001003	$118,175	$118,175	$229,387	$229,387	$340,598	$340,598
1702001004	$73,661	$73,661	$132,934	$132,934	$192,206	$192,206
1702001101	$534,189	$534,189	$1,030,134	$1,030,134	$1,526,078	$1,526,078
1702001102	$369,225	$369,225	$697,002	$697,002	$1,024,779	$1,024,779
1702001103	$430,301	$430,301	$800,662	$800,662	$1,171,022	$1,171,022
1702001104	$762,942	$762,942	$1,638,779	$1,638,779	$2,514,617	$2,514,617
1702001105	$392,037	$392,037	$782,854	$782,854	$1,173,672	$1,173,672
1702001604	$108,889	$108,889	$209,134	$209,134	$309,379	$309,379
1702001605	$2,953	$2,953	$23,173	$23,173	$43,393	$43,393
1702001606	$174,280	$180,008	$494,211	$499,939	$814,142	$819,869
1707010101	$491,755	$491,755	$1,061,614	$1,061,614	$1,631,473	$1,631,473
1707010102	$14,491	$14,491	$140,237	$140,237	$265,983	$265,983
1707010106	$2,601	$2,601	$19,723	$19,723	$36,845	$36,845
1707010109	$41,815	$41,815	$56,761	$56,761	$71,706	$71,706
1707010114	$149,630	$152,494	$500,262	$503,126	$850,894	$853,757
1707010501	$198,075	$198,075	$373,628	$373,628	$549,180	$549,180
1707010504	$142,258	$147,985	$336,168	$341,896	$530,079	$535,806
1707010512	$103,903	$103,903	$211,237	$211,237	$318,570	$318,570
1707010513	$171,313	$171,313	$343,609	$343,609	$515,905	$515,905
1708000107	$429,293	$429,293	$840,460	$840,460	$1,251,628	$1,251,628

Oregon Coast coho salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$57,060	$59,924	$158,050	$160,913	$259,039	$261,903
1710020201	$66,246	$66,246	$119,318	$119,318	$172,391	$172,391
1710020202	$810	$810	$12,690	$12,690	$24,570	$24,570
1710020203	$14,940	$14,940	$49,277	$49,277	$83,614	$83,614
1710020204	$678	$678	$696	$696	$714	$714
1710020205	$679	$679	$55,391	$55,391	$110,103	$110,103
1710020206	$1,402	$1,402	$2,836	$2,836	$4,270	$4,270
1710020301	$60,559	$60,559	$115,305	$115,305	$170,050	$170,050
1710020302	$343,962	$343,962	$658,416	$658,416	$972,871	$972,871
1710020303	$16,670	$16,670	$31,846	$31,846	$47,021	$47,021
1710020304	$74,168	$77,032	$213,910	$216,774	$353,652	$356,516
1710020305	$27,686	$30,550	$42,381	$45,245	$57,077	$59,940
1710020306	$9,732	$9,732	$18,023	$18,023	$26,314	$26,314
1710020307	$8,344	$8,344	$18,191	$18,191	$28,038	$28,038
1710020308	$22,558	$22,558	$28,029	$28,029	$33,499	$33,499
1710020309	$51,268	$51,268	$101,150	$101,150	$151,033	$151,033
1710020401	$13,293	$13,293	$14,473	$14,473	$15,653	$15,653
1710020402	$58,098	$58,098	$111,214	$111,214	$164,329	$164,329
1710020403	$50,888	$53,752	$193,730	$196,593	$336,571	$339,435
1710020405	$45	$45	$86	$86	$127	$127
1710020406	$4,534	$4,534	$8,678	$8,678	$12,822	$12,822
1710020407	$89,717	$92,581	$181,692	$184,555	$273,666	$276,530
1710020408	$38,019	$38,019	$74,883	$74,883	$111,747	$111,747
1710020409	$35,988	$35,988	$70,901	$70,901	$105,815	$105,815
1710020501	$136,433	$136,433	$261,884	$261,884	$387,335	$387,335
1710020502	$189,973	$189,973	$364,961	$364,961	$539,948	$539,948
1710020503	$91,394	$91,394	$174,925	$174,925	$258,455	$258,455
1710020504	$302,062	$302,062	$643,948	$643,948	$985,834	$985,834
1710020505	$33,900	$33,900	$63,676	$63,676	$93,452	$93,452
1710020506	$62,607	$62,607	$119,827	$119,827	$177,048	$177,048
1710020507	$166,296	$166,296	$321,004	$321,004	$475,712	$475,712
1710020508	$22,186	$22,186	$42,463	$42,463	$62,740	$62,740
1710020601	$207,060	$207,060	$376,516	$376,516	$545,971	$545,971
1710020602	$51,481	$51,481	$98,533	$98,533	$145,584	$145,584
1710020603	$43,393	$43,393	$83,053	$83,053	$122,713	$122,713
1710020604	$117,872	$117,872	$225,072	$225,072	$332,272	$332,272
1710020605	$93,755	$93,755	$179,444	$179,444	$265,133	$265,133
1710020606	$78,336	$78,336	$149,936	$149,936	$221,535	$221,535
1710020607	$98,341	$98,341	$188,221	$188,221	$278,101	$278,101
1710020608	$173,033	$173,033	$328,800	$328,800	$484,566	$484,566

Oregon Coast coho salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$148,657	$148,657	$458,095	$458,095	$767,533	$767,533
1710030106	$60,097	$60,097	$115,024	$115,024	$169,951	$169,951
1710030107	$366,275	$366,275	$684,634	$684,634	$1,002,993	$1,002,993
1710030108	$317,333	$317,333	$607,364	$607,364	$897,394	$897,394
1710030109	$95,677	$95,677	$183,123	$183,123	$270,568	$270,568
1710030110	$87,574	$87,574	$168,973	$168,973	$250,372	$250,372
1710030111	$257,403	$257,403	$523,327	$523,327	$789,251	$789,251
1710030112	$31,171	$31,171	$329,403	$329,403	$627,636	$627,636
1710030201	$267,936	$267,936	$512,827	$512,827	$757,718	$757,718
1710030202	$296,324	$296,324	$567,160	$567,160	$837,995	$837,995
1710030203	$277,219	$277,219	$520,896	$520,896	$764,574	$764,574
1710030204	$103,687	$103,687	$199,819	$199,819	$295,950	$295,950
1710030205	$188,903	$188,903	$400,262	$400,262	$611,621	$611,621
1710030207	$151,488	$151,488	$333,112	$333,112	$514,736	$514,736
1710030208	$92,248	$92,248	$176,562	$176,562	$260,876	$260,876
1710030209	$124,478	$124,478	$271,109	$271,109	$417,741	$417,741
1710030210	$25,200	$25,200	$171,751	$171,751	$318,302	$318,302
1710030211	$96,063	$96,063	$266,585	$266,585	$437,107	$437,107
1710030212	$85,968	$85,968	$315,092	$315,092	$544,215	$544,215
1710030213	$106,425	$109,289	$481,790	$484,654	$857,155	$860,018
1710030301	$181,430	$181,430	$453,916	$453,916	$726,403	$726,403
1710030302	$39,722	$39,722	$115,336	$115,336	$190,949	$190,949
1710030303	$162,865	$162,865	$396,292	$396,292	$629,718	$629,718
1710030304	$70,751	$70,751	$199,123	$199,123	$327,496	$327,496
1710030305	$98,150	$98,150	$168,474	$168,474	$238,799	$238,799
1710030306	$174,786	$174,786	$334,534	$334,534	$494,282	$494,282
1710030307	$269,550	$269,550	$509,804	$509,804	$750,058	$750,058
1710030308	$61,417	$61,417	$202,199	$202,199	$342,982	$342,982
1710030401	$87,989	$87,989	$168,408	$168,408	$248,827	$248,827
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$28,047	$28,047	$86,312	$86,312	$144,577	$144,577
1710030404	$270,025	$281,481	$670,486	$681,941	$1,070,946	$1,082,401
1710030501	$206,714	$206,714	$395,653	$395,653	$584,591	$584,591
1710030502	$199,619	$199,619	$384,179	$384,179	$568,739	$568,739
1710030503	$29,947	$29,947	$140,217	$140,217	$250,487	$250,487
1710030504	$144,762	$144,762	$277,077	$277,077	$409,392	$409,392
1710030505	$123,395	$123,395	$275,739	$275,739	$428,082	$428,082
1710030506	$61,584	$61,584	$185,633	$185,633	$309,682	$309,682
1710030603	$75,512	$75,512	$207,630	$207,630	$339,747	$339,747
1710030604	$17,211	$17,211	$56,154	$56,154	$95,097	$95,097

Hood Canal Summer-run chum salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$746,109	$746,109	$993,841	$993,841	$1,241,573	$1,241,573
1711001802	$53,596	$53,596	$109,309	$109,309	$165,022	$165,022
1711001803	$126,704	$126,704	$243,866	$243,866	$361,028	$361,028
1711001804	$47,936	$47,936	$91,747	$91,747	$135,559	$135,559
1711001805	$76,903	$76,903	$137,500	$137,500	$198,096	$198,096
1711001806	$129,425	$129,425	$252,478	$252,478	$375,530	$375,530
1711001807	$113,929	$113,929	$263,891	$263,891	$413,853	$413,853
1711001808	$199,599	$199,599	$596,887	$596,887	$994,175	$994,175
1711001908	$270,620	$270,620	$606,233	$606,233	$941,845	$941,845
1711002001	$60,549	$60,549	$132,665	$132,665	$204,781	$204,781
1711002002	$46,154	$46,154	$83,174	$83,174	$120,194	$120,194
1711002003	$171,091	$171,091	$409,701	$409,701	$648,311	$648,311
N15	$313,290	$313,290	$958,049	$958,049	$1,602,809	$1,602,809
N16	$156,250	$156,250	$340,625	$340,625	$525,000	$525,000
N17	$44,477	$44,477	$116,754	$116,754	$189,031	$189,031
N18	$653,500	$653,500	$1,452,160	$1,452,160	$2,250,820	$2,250,820
N19	$383,000	$383,000	$835,440	$835,440	$1,287,880	$1,287,880

Columbia River chum salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$1,259,327	$1,899,042	$1,601,128	$2,240,843	$1,942,930	$2,582,645
1707010512	$103,903	$103,903	$211,237	$211,237	$318,570	$318,570
1707010513	$171,313	$171,313	$343,609	$343,609	$515,905	$515,905
1708000106	$139,115	$141,979	$371,139	$374,003	$603,164	$606,028
1708000107	$429,293	$429,293	$840,460	$840,460	$1,251,628	$1,251,628
1708000109	$1,820,008	$1,834,327	$3,904,144	$3,918,463	$5,988,281	$6,002,599
1708000205	$471,095	$471,095	$825,934	$825,934	$1,180,773	$1,180,773
1708000206	$260,290	$262,788	$547,174	$549,672	$834,058	$836,556
1708000301	$305,071	$307,935	$571,406	$574,269	$837,741	$840,604
1708000304	$922,131	$927,858	$2,126,712	$2,132,440	$3,331,294	$3,337,022
1708000305	$112,500	$112,500	$249,330	$249,330	$386,160	$386,160
1708000503	$227,420	$227,420	$592,113	$592,113	$956,805	$956,805
1708000504	$136,315	$136,315	$364,630	$364,630	$592,945	$592,945
1708000505	$59,412	$59,412	$113,712	$113,712	$168,012	$168,012
1708000506	$26,412	$26,412	$50,552	$50,552	$74,692	$74,692
1708000507	$171,547	$171,547	$370,319	$370,319	$569,091	$569,091
1708000508	$195,740	$195,740	$394,835	$394,835	$593,930	$593,930

Columbia River chum salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
1708000602	$30,500	$33,364	$211,213	$214,077	$391,927	$394,790
1708000603	$12,745	$12,745	$52,549	$52,549	$92,353	$92,353

Ozette Lake sockeye salmon ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
1710010102	$0	$0	$2,720	$2,720	$5,440	$5,440

Upper Columbia River O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	**Low - 3%**	**Low - 7%**	**Mid - 3%**	**Mid - 7%**	**High - 3%**	**High - 7%**
1702000503	$34,705	$34,705	$85,522	$85,522	$136,339	$136,339
1702000504	$26,978	$26,978	$86,568	$86,568	$146,158	$146,158
1702000505	$164,396	$164,396	$375,689	$375,689	$586,981	$586,981
1702000601	$128,257	$128,257	$497,747	$497,747	$867,236	$867,236
1702000602	$125,817	$125,817	$383,308	$383,308	$640,799	$640,799
1702000603	$133,012	$133,012	$518,725	$518,725	$904,439	$904,439
1702000604	$39,688	$39,688	$175,171	$175,171	$310,655	$310,655
1702000605	$163,780	$163,780	$530,604	$530,604	$897,428	$897,428
1702000704	$28,001	$28,001	$77,760	$77,760	$127,519	$127,519
1702000801	$173,793	$173,793	$354,033	$354,033	$534,272	$534,272
1702000802	$212,200	$212,200	$425,784	$425,784	$639,369	$639,369
1702000803	$232,171	$232,171	$472,951	$472,951	$713,730	$713,730
1702000804	$302,675	$302,675	$631,859	$631,859	$961,042	$961,042
1702000805	$248,609	$248,609	$534,866	$534,866	$821,123	$821,123
1702000806	$425,383	$425,383	$1,022,852	$1,022,852	$1,620,320	$1,620,320
1702000807	$290,447	$290,447	$607,640	$607,640	$924,833	$924,833
1702000903	$2,839,622	$4,339,339	$3,172,218	$4,671,935	$3,504,814	$5,004,532
1702001001	$722,122	$722,122	$1,389,403	$1,389,403	$2,056,683	$2,056,683
1702001002	$1,076,986	$1,082,713	$2,605,867	$2,611,595	$4,134,749	$4,140,477
1702001003	$118,175	$118,175	$229,387	$229,387	$340,598	$340,598
1702001004	$73,661	$73,661	$132,934	$132,934	$192,206	$192,206
1702001101	$534,189	$534,189	$1,030,134	$1,030,134	$1,526,078	$1,526,078
1702001102	$369,225	$369,225	$697,002	$697,002	$1,024,779	$1,024,779
1702001103	$430,301	$430,301	$800,662	$800,662	$1,171,022	$1,171,022
1702001104	$762,942	$762,942	$1,638,779	$1,638,779	$2,514,617	$2,514,617

Upper Columbia River O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$392,037	$392,037	$782,854	$782,854	$1,173,672	$1,173,672
1702001204	$58,990	$58,990	$129,438	$129,438	$199,886	$199,886
1702001509	$46,432	$46,432	$664,299	$664,299	$1,282,165	$1,282,165
1702001604	$108,889	$108,889	$209,134	$209,134	$309,379	$309,379
1702001605	$2,953	$2,953	$23,173	$23,173	$43,393	$43,393
1702001606	$174,280	$180,008	$494,211	$499,939	$814,142	$819,869
1707010101	$491,755	$491,755	$1,061,614	$1,061,614	$1,631,473	$1,631,473
1707010102	$14,491	$14,491	$140,237	$140,237	$265,983	$265,983
1707010106	$2,601	$2,601	$19,723	$19,723	$36,845	$36,845
1707010109	$41,815	$41,815	$56,761	$56,761	$71,706	$71,706
1707010114	$149,630	$152,494	$500,262	$503,126	$850,894	$853,757
1707010501	$198,075	$198,075	$373,628	$373,628	$549,180	$549,180
1707010504	$142,258	$147,985	$336,168	$341,896	$530,079	$535,806
1707010512	$103,903	$103,903	$211,237	$211,237	$318,570	$318,570
1707010513	$171,313	$171,313	$343,609	$343,609	$515,905	$515,905
1708000107	$429,293	$429,293	$840,460	$840,460	$1,251,628	$1,251,628

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$174,280	$180,008	$494,211	$499,939	$814,142	$819,869
1706010101	$193,040	$193,040	$391,997	$391,997	$590,953	$590,953
1706010102	$147,300	$147,300	$299,745	$299,745	$452,191	$452,191
1706010104	$58,317	$58,317	$118,115	$118,115	$177,913	$177,913
1706010201	$156,447	$156,447	$320,118	$320,118	$483,790	$483,790
1706010202	$120,063	$120,063	$244,573	$244,573	$369,083	$369,083
1706010203	$116,353	$116,353	$237,016	$237,016	$357,679	$357,679
1706010204	$69,259	$69,259	$120,798	$120,798	$172,337	$172,337
1706010205	$194,732	$194,732	$396,676	$396,676	$598,620	$598,620
1706010301	$336,136	$336,136	$799,758	$799,758	$1,263,381	$1,263,381
1706010302	$195,123	$195,123	$373,533	$373,533	$551,944	$551,944
1706010303	$491,602	$491,602	$1,181,103	$1,181,103	$1,870,604	$1,870,604
1706010401	$191,828	$191,828	$390,207	$390,207	$588,586	$588,586
1706010402	$140,138	$140,138	$388,442	$388,442	$636,746	$636,746
1706010403	$104,688	$104,688	$222,922	$222,922	$341,157	$341,157
1706010404	$61,519	$61,519	$125,314	$125,314	$189,110	$189,110
1706010405	$79,776	$79,776	$174,232	$174,232	$268,688	$268,688
1706010406	$37,863	$40,727	$66,255	$69,119	$94,647	$97,511

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$28,026	$28,026	$117,227	$117,227	$206,428	$206,428
1706010408	$36,480	$36,480	$70,447	$70,447	$104,414	$104,414
1706010409	$61,036	$61,036	$135,246	$135,246	$209,456	$209,456
1706010410	$145,714	$145,714	$300,997	$300,997	$456,280	$456,280
1706010411	$116,828	$116,828	$189,727	$189,727	$262,625	$262,625
1706010501	$101,956	$101,956	$212,491	$212,491	$323,026	$323,026
1706010502	$71,336	$71,336	$176,389	$176,389	$281,441	$281,441
1706010503	$1,389	$1,389	$4,188	$4,188	$6,988	$6,988
1706010504	$59,749	$59,749	$132,070	$132,070	$204,390	$204,390
1706010505	$222,231	$222,231	$452,694	$452,694	$683,156	$683,156
1706010506	$28,648	$28,648	$46,507	$46,507	$64,366	$64,366
1706010601	$149,883	$149,883	$288,764	$288,764	$427,645	$427,645
1706010602	$94,398	$94,398	$202,650	$202,650	$310,902	$310,902
1706010603	$563,089	$563,089	$1,077,827	$1,077,827	$1,592,564	$1,592,564
1706010604	$103,521	$103,521	$210,877	$210,877	$318,233	$318,233
1706010605	$101,498	$101,498	$195,766	$195,766	$290,034	$290,034
1706010606	$95,592	$95,592	$194,733	$194,733	$293,873	$293,873
1706010607	$88,552	$88,552	$181,029	$181,029	$273,506	$273,506
1706010701	$406	$406	$2,187	$2,187	$3,967	$3,967
1706010702	$227,119	$227,119	$467,677	$467,677	$708,235	$708,235
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$3,673	$3,673	$3,821	$3,821	$3,969	$3,969
1706010705	$48,316	$48,316	$73,308	$73,308	$98,300	$98,300
1706010706	$210,790	$210,790	$415,177	$415,177	$619,565	$619,565
1706010707	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010708	$50,610	$50,610	$96,568	$96,568	$142,526	$142,526
1706010808	$1,323	$1,323	$4,056	$4,056	$6,788	$6,788
1706011001	$44,840	$44,840	$97,596	$97,596	$150,352	$150,352
1706011003	$57,225	$57,225	$124,611	$124,611	$191,997	$191,997
1706011004	$41,749	$44,612	$102,063	$104,926	$162,377	$165,240
1706020101	$150,818	$150,818	$268,647	$268,647	$386,475	$386,475
1706020104	$70,676	$70,676	$129,076	$129,076	$187,475	$187,475
1706020105	$138,576	$138,576	$291,126	$291,126	$443,675	$443,675
1706020107	$39,453	$39,453	$74,750	$74,750	$110,047	$110,047
1706020108	$88,862	$88,862	$177,754	$177,754	$266,646	$266,646
1706020109	$81,890	$81,890	$168,099	$168,099	$254,308	$254,308
1706020110	$52,500	$52,500	$100,563	$100,563	$148,626	$148,626
1706020111	$21,827	$21,827	$40,447	$40,447	$59,067	$59,067
1706020112	$36,028	$36,028	$82,050	$82,050	$128,073	$128,073
1706020113	$259,530	$259,530	$361,180	$361,180	$462,830	$462,830

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$234,361	$234,361	$557,756	$557,756	$881,151	$881,151
1706020115	$147,159	$147,159	$229,962	$229,962	$312,766	$312,766
1706020117	$52,441	$52,441	$132,016	$132,016	$211,592	$211,592
1706020118	$51,815	$51,815	$105,822	$105,822	$159,830	$159,830
1706020119	$55,348	$55,348	$107,471	$107,471	$159,594	$159,594
1706020120	$73,784	$73,784	$151,439	$151,439	$229,093	$229,093
1706020121	$18,015	$18,015	$33,382	$33,382	$48,748	$48,748
1706020122	$50,653	$53,517	$99,609	$102,473	$148,565	$151,428
1706020123	$36,462	$36,462	$67,566	$67,566	$98,669	$98,669
1706020124	$32,605	$32,605	$63,688	$63,688	$94,772	$94,772
1706020125	$62,092	$62,092	$433,003	$433,003	$803,913	$803,913
1706020126	$24,744	$24,744	$45,849	$45,849	$66,955	$66,955
1706020127	$18,830	$18,830	$34,897	$34,897	$50,963	$50,963
1706020128	$34,869	$34,869	$282,604	$282,604	$530,338	$530,338
1706020129	$52,386	$52,386	$110,155	$110,155	$167,923	$167,923
1706020130	$27,902	$27,902	$51,710	$51,710	$75,517	$75,517
1706020132	$55,309	$55,309	$105,769	$105,769	$156,229	$156,229
1706020201	$52,294	$52,294	$98,549	$98,549	$144,803	$144,803
1706020202	$69,090	$69,090	$128,041	$128,041	$186,992	$186,992
1706020203	$21,417	$21,417	$39,691	$39,691	$57,965	$57,965
1706020301	$46,967	$46,967	$95,203	$95,203	$143,440	$143,440
1706020302	$22,132	$22,132	$41,009	$41,009	$59,887	$59,887
1706020303	$66,188	$66,188	$125,916	$125,916	$185,645	$185,645
1706020304	$82,873	$82,873	$102,985	$102,985	$123,096	$123,096
1706020305	$121,385	$121,385	$244,557	$244,557	$367,730	$367,730
1706020306	$98,757	$98,757	$173,962	$173,962	$249,167	$249,167
1706020307	$31,354	$31,354	$49,058	$49,058	$66,763	$66,763
1706020308	$40,467	$40,467	$56,902	$56,902	$73,337	$73,337
1706020309	$30,836	$30,836	$82,339	$82,339	$133,843	$133,843
1706020310	$31,977	$31,977	$59,261	$59,261	$86,545	$86,545
1706020311	$45,958	$45,958	$86,505	$86,505	$127,052	$127,052
1706020312	$58,107	$58,107	$107,687	$107,687	$157,267	$157,267
1706020313	$31,421	$31,421	$59,591	$59,591	$87,762	$87,762
1706020314	$23,500	$23,500	$43,551	$43,551	$63,602	$63,602
1706020315	$27,400	$27,400	$50,780	$50,780	$74,159	$74,159
1706020316	$17,739	$17,739	$32,875	$32,875	$48,011	$48,011
1706020317	$34,889	$34,889	$76,393	$76,393	$117,897	$117,897
1706020318	$16,313	$16,313	$30,232	$30,232	$44,150	$44,150
1706020319	$36,384	$36,384	$88,189	$88,189	$139,994	$139,994
1706020320	$18,839	$18,839	$34,910	$34,910	$50,981	$50,981

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$19,411	$19,411	$35,968	$35,968	$52,524	$52,524
1706020322	$70,888	$70,888	$142,806	$142,806	$214,724	$214,724
1706020323	$20,946	$20,946	$38,817	$38,817	$56,687	$56,687
1706020401	$25,091	$25,091	$46,499	$46,499	$67,908	$67,908
1706020402	$43,693	$43,693	$175,727	$175,727	$307,762	$307,762
1706020403	$29,770	$29,770	$55,171	$55,171	$80,573	$80,573
1706020404	$16,920	$16,920	$31,358	$31,358	$45,795	$45,795
1706020405	$20,322	$20,322	$37,663	$37,663	$55,003	$55,003
1706020406	$25,111	$25,111	$67,297	$67,297	$109,484	$109,484
1706020407	$22,433	$22,433	$51,955	$51,955	$81,476	$81,476
1706020408	$34,616	$34,616	$64,153	$64,153	$93,689	$93,689
1706020409	$25,332	$25,332	$46,947	$46,947	$68,562	$68,562
1706020414	$55,967	$55,967	$103,720	$103,720	$151,474	$151,474
1706020501	$57,315	$57,315	$106,203	$106,203	$155,091	$155,091
1706020502	$41,433	$41,433	$76,773	$76,773	$112,113	$112,113
1706020503	$55,616	$55,616	$103,054	$103,054	$150,492	$150,492
1706020504	$18,798	$18,798	$34,831	$34,831	$50,864	$50,864
1706020505	$53,169	$53,169	$98,520	$98,520	$143,870	$143,870
1706020506	$65,401	$65,401	$121,193	$121,193	$176,986	$176,986
1706020507	$66,081	$66,081	$122,445	$122,445	$178,809	$178,809
1706020508	$83,050	$83,050	$153,912	$153,912	$224,773	$224,773
1706020509	$21,579	$21,579	$39,987	$39,987	$58,394	$58,394
1706020510	$49,835	$49,835	$92,342	$92,342	$134,848	$134,848
1706020511	$36,509	$36,509	$67,649	$67,649	$98,789	$98,789
1706020512	$50,720	$50,720	$93,982	$93,982	$137,244	$137,244
1706020513	$51,254	$51,254	$94,970	$94,970	$138,687	$138,687
1706020601	$66,858	$66,858	$123,884	$123,884	$180,911	$180,911
1706020602	$16,381	$16,381	$30,354	$30,354	$44,326	$44,326
1706020603	$37,682	$37,682	$69,826	$69,826	$101,970	$101,970
1706020604	$46,617	$46,617	$127,899	$127,899	$209,180	$209,180
1706020605	$32,716	$32,716	$84,658	$84,658	$136,601	$136,601
1706020606	$57,840	$57,840	$107,178	$107,178	$156,517	$156,517
1706020607	$16,598	$16,598	$30,755	$30,755	$44,912	$44,912
1706020608	$38,832	$38,832	$75,226	$75,226	$111,619	$111,619
1706020609	$44,065	$44,065	$81,656	$81,656	$119,246	$119,246
1706020610	$41,513	$41,513	$87,301	$87,301	$133,088	$133,088
1706020611	$53,778	$53,778	$99,647	$99,647	$145,516	$145,516
1706020612	$15,803	$15,803	$29,282	$29,282	$42,761	$42,761
1706020613	$62,999	$62,999	$89,604	$89,604	$116,208	$116,208
1706020614	$19,020	$19,020	$35,244	$35,244	$51,467	$51,467

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$14,513	$14,513	$26,891	$26,891	$39,269	$39,269
1706020616	$44,742	$44,742	$82,905	$82,905	$121,067	$121,067
1706020617	$55,339	$55,339	$109,081	$109,081	$162,823	$162,823
1706020701	$33,789	$33,789	$67,517	$67,517	$101,245	$101,245
1706020702	$27,245	$27,245	$50,492	$50,492	$73,739	$73,739
1706020703	$57,008	$57,008	$108,910	$108,910	$160,812	$160,812
1706020704	$22,397	$22,397	$41,508	$41,508	$60,619	$60,619
1706020705	$55,967	$55,967	$103,721	$103,721	$151,474	$151,474
1706020706	$21,463	$21,463	$39,773	$39,773	$58,083	$58,083
1706020707	$24,869	$24,869	$46,088	$46,088	$67,307	$67,307
1706020708	$89,387	$89,387	$165,643	$165,643	$241,899	$241,899
1706020709	$49,822	$49,822	$92,431	$92,431	$135,041	$135,041
1706020710	$24,431	$24,431	$45,272	$45,272	$66,113	$66,113
1706020711	$124,248	$124,248	$236,910	$236,910	$349,572	$349,572
1706020712	$75,851	$75,851	$144,386	$144,386	$212,921	$212,921
1706020713	$91,618	$91,618	$173,986	$173,986	$256,354	$256,354
1706020714	$62,775	$62,775	$116,411	$116,411	$170,047	$170,047
1706020715	$29,899	$29,899	$55,401	$55,401	$80,903	$80,903
1706020716	$26,214	$26,214	$48,574	$48,574	$70,933	$70,933
1706020717	$40,113	$40,113	$74,326	$74,326	$108,540	$108,540
1706020718	$61,021	$61,021	$113,069	$113,069	$165,116	$165,116
1706020719	$48,901	$48,901	$82,928	$82,928	$116,955	$116,955
1706020801	$73,640	$73,640	$127,406	$127,406	$181,173	$181,173
1706020802	$54,626	$54,626	$101,219	$101,219	$147,812	$147,812
1706020803	$42,845	$42,845	$70,346	$70,346	$97,847	$97,847
1706020804	$64,772	$64,772	$123,290	$123,290	$181,808	$181,808
1706020805	$52,161	$52,161	$78,571	$78,571	$104,981	$104,981
1706020806	$16,706	$16,706	$30,960	$30,960	$45,214	$45,214
1706020807	$65,024	$65,024	$114,723	$114,723	$164,422	$164,422
1706020808	$75,812	$75,812	$151,923	$151,923	$228,034	$228,034
1706020809	$30,620	$30,620	$56,738	$56,738	$82,855	$82,855
1706020810	$53,640	$53,640	$102,663	$102,663	$151,685	$151,685
1706020811	$21,075	$21,075	$39,052	$39,052	$57,028	$57,028
1706020812	$22,047	$22,047	$40,851	$40,851	$59,656	$59,656
1706020813	$59,698	$59,698	$101,579	$101,579	$143,460	$143,460
1706020814	$41,988	$41,988	$79,444	$79,444	$116,901	$116,901
1706020815	$19,547	$19,547	$36,225	$36,225	$52,903	$52,903
1706020901	$5,155	$5,155	$9,554	$9,554	$13,952	$13,952
1706020902	$1,417	$1,417	$2,625	$2,625	$3,834	$3,834
1706020903	$671	$671	$1,243	$1,243	$1,815	$1,815

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$3,069	$3,069	$5,688	$5,688	$8,307	$8,307
1706020905	$17,219	$17,219	$22,864	$22,864	$28,510	$28,510
1706020906	$12,274	$12,274	$12,355	$12,355	$12,436	$12,436
1706020907	$28,097	$28,097	$60,239	$60,239	$92,381	$92,381
1706020908	$29,881	$29,881	$59,730	$59,730	$89,580	$89,580
1706020909	$14,935	$14,935	$21,711	$21,711	$28,486	$28,486
1706020910	$9,632	$9,632	$17,850	$17,850	$26,069	$26,069
1706020911	$73,240	$73,240	$137,636	$137,636	$202,032	$202,032
1706020912	$130,591	$130,591	$196,230	$196,230	$261,870	$261,870
1706020913	$94,975	$94,975	$144,548	$144,548	$194,121	$194,121
1706020914	$14,154	$14,154	$26,230	$26,230	$38,307	$38,307
1706020915	$23,469	$23,469	$46,215	$46,215	$68,960	$68,960
1706020916	$28,654	$28,654	$53,103	$53,103	$77,552	$77,552
1706020917	$687	$687	$11,652	$11,652	$22,618	$22,618
1706021001	$176,210	$176,210	$301,774	$301,774	$427,337	$427,337
1706021002	$69,834	$69,834	$139,043	$139,043	$208,251	$208,251
1706021003	$17,856	$17,856	$33,092	$33,092	$48,328	$48,328
1706021006	$31,073	$31,073	$62,487	$62,487	$93,901	$93,901
1706021007	$73,918	$73,918	$131,898	$131,898	$189,879	$189,879
1706030101	$51,005	$51,005	$94,672	$94,672	$138,339	$138,339
1706030102	$80,654	$80,654	$160,043	$160,043	$239,431	$239,431
1706030103	$220,941	$220,941	$422,867	$422,867	$624,792	$624,792
1706030104	$257,816	$257,816	$493,440	$493,440	$729,064	$729,064
1706030105	$97,335	$97,335	$186,295	$186,295	$275,255	$275,255
1706030106	$404,813	$404,813	$774,776	$774,776	$1,144,738	$1,144,738
1706030107	$139,216	$139,216	$266,449	$266,449	$393,683	$393,683
1706030108	$91,996	$91,996	$174,566	$174,566	$257,135	$257,135
1706030109	$13,645	$13,645	$25,361	$25,361	$37,076	$37,076
1706030201	$47,631	$47,631	$88,261	$88,261	$128,892	$128,892
1706030202	$20,682	$20,682	$38,323	$38,323	$55,963	$55,963
1706030203	$43,009	$43,009	$79,694	$79,694	$116,378	$116,378
1706030204	$11,744	$11,744	$21,762	$21,762	$31,779	$31,779
1706030205	$24,837	$24,837	$46,022	$46,022	$67,207	$67,207
1706030207	$44,140	$44,140	$81,788	$81,788	$119,437	$119,437
1706030208	$49,307	$49,307	$91,362	$91,362	$133,418	$133,418
1706030209	$49,746	$49,746	$92,176	$92,176	$134,606	$134,606
1706030210	$14,521	$14,521	$26,907	$26,907	$39,293	$39,293
1706030211	$25,084	$25,084	$46,487	$46,487	$67,889	$67,889
1706030212	$29,978	$29,978	$55,551	$55,551	$81,125	$81,125
1706030213	$50,376	$50,376	$93,350	$93,350	$136,324	$136,324

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$25,430	$25,430	$47,124	$47,124	$68,819	$68,819
1706030301	$93,643	$93,643	$174,635	$174,635	$255,628	$255,628
1706030302	$37,957	$37,957	$70,332	$70,332	$102,706	$102,706
1706030303	$81,360	$81,360	$158,932	$158,932	$236,505	$236,505
1706030304	$68,923	$68,923	$132,616	$132,616	$196,309	$196,309
1706030305	$3,358	$3,358	$6,222	$6,222	$9,086	$9,086
1706030306	$27,481	$27,481	$50,920	$50,920	$74,360	$74,360
1706030307	$44,605	$44,605	$90,826	$90,826	$137,048	$137,048
1706030308	$29,332	$29,332	$57,621	$57,621	$85,910	$85,910
1706030309	$21,494	$21,494	$39,826	$39,826	$58,159	$58,159
1706030310	$69,575	$69,575	$128,919	$128,919	$188,263	$188,263
1706030311	$30,973	$30,973	$57,392	$57,392	$83,810	$83,810
1706030312	$22,643	$22,643	$41,956	$41,956	$61,269	$61,269
1706030313	$20,924	$20,924	$38,770	$38,770	$56,617	$56,617
1706030314	$19,228	$19,228	$35,628	$35,628	$52,028	$52,028
1706030401	$33,127	$33,127	$66,289	$66,289	$99,451	$99,451
1706030402	$29,372	$29,372	$54,433	$54,433	$79,495	$79,495
1706030501	$46,869	$46,869	$83,800	$83,800	$120,731	$120,731
1706030502	$27,051	$27,051	$53,400	$53,400	$79,749	$79,749
1706030503	$33,840	$33,840	$62,713	$62,713	$91,587	$91,587
1706030504	$34,572	$34,572	$64,070	$64,070	$93,569	$93,569
1706030505	$33,405	$33,405	$63,542	$63,542	$93,680	$93,680
1706030506	$33,541	$33,541	$63,520	$63,520	$93,498	$93,498
1706030507	$88,043	$88,043	$169,701	$169,701	$251,359	$251,359
1706030508	$30,400	$30,400	$56,338	$56,338	$82,277	$82,277
1706030509	$34,092	$34,092	$54,135	$54,135	$74,178	$74,178
1706030510	$48,178	$48,178	$89,285	$89,285	$130,393	$130,393
1706030511	$16,208	$16,208	$30,038	$30,038	$43,867	$43,867
1706030512	$20,059	$20,059	$49,149	$49,149	$78,240	$78,240
1706030513	$7,295	$7,295	$8,927	$8,927	$10,559	$10,559
1706030601	$111,005	$116,732	$355,541	$361,268	$600,076	$605,804
1706030602	$5,427	$5,427	$11,692	$11,692	$17,956	$17,956
1706030603	$30,066	$30,066	$68,242	$68,242	$106,418	$106,418
1706030604	$412	$412	$34,624	$34,624	$68,837	$68,837
1706030606	$15,361	$15,361	$33,369	$33,369	$51,377	$51,377
1706030607	$37,397	$37,397	$84,040	$84,040	$130,682	$130,682
1706030608	$10,570	$10,570	$22,857	$22,857	$35,144	$35,144
1706030609	$30,190	$30,190	$65,751	$65,751	$101,313	$101,313
1706030610	$32,736	$32,736	$70,471	$70,471	$108,206	$108,206
1706030611	$1,019	$1,019	$13,628	$13,628	$26,237	$26,237

Snake River Basin O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$51,006	$51,006	$97,944	$97,944	$144,882	$144,882
1706030613	$23,817	$23,817	$33,500	$33,500	$43,182	$43,182
1706030614	$55,310	$55,310	$93,956	$93,956	$132,601	$132,601
1706030615	$21,608	$21,608	$36,511	$36,511	$51,414	$51,414
1706030616	$11,186	$11,186	$20,730	$20,730	$30,274	$30,274
1706030617	$24,753	$24,753	$50,773	$50,773	$76,794	$76,794
1706030618	$157,238	$157,238	$376,952	$376,952	$596,667	$596,667
1706030619	$19,149	$19,149	$35,486	$35,486	$51,822	$51,822
1706030620	$48,105	$48,105	$90,400	$90,400	$132,696	$132,696
1706030621	$11,537	$11,537	$24,648	$24,648	$37,759	$37,759
1706030622	$37,485	$37,485	$67,230	$67,230	$96,976	$96,976
1706030623	$5,554	$5,554	$16,007	$16,007	$26,460	$26,460
1706030624	$163	$163	$303	$303	$442	$442
1706030627	$25	$25	$46	$46	$68	$68
1706030630	$6,492	$6,492	$117,466	$117,466	$228,440	$228,440
1706030631	$26,967	$26,967	$50,117	$50,117	$73,267	$73,267
1706030801	$10,307	$10,307	$32,749	$32,749	$55,191	$55,191
1707010101	$491,755	$491,755	$1,061,614	$1,061,614	$1,631,473	$1,631,473
1707010102	$14,491	$14,491	$140,237	$140,237	$265,983	$265,983
1707010106	$2,601	$2,601	$19,723	$19,723	$36,845	$36,845
1707010109	$41,815	$41,815	$56,761	$56,761	$71,706	$71,706
1707010114	$149,630	$152,494	$500,262	$503,126	$850,894	$853,757
1707010501	$198,075	$198,075	$373,628	$373,628	$549,180	$549,180
1707010504	$142,258	$147,985	$336,168	$341,896	$530,079	$535,806
1707010512	$103,903	$103,903	$211,237	$211,237	$318,570	$318,570
1707010513	$171,313	$171,313	$343,609	$343,609	$515,905	$515,905
1708000107	$429,293	$429,293	$840,460	$840,460	$1,251,628	$1,251,628

Lower Columbia River O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$270,833	$270,833	$580,791	$580,791	$890,750	$890,750
1707010507	$167,623	$167,623	$291,752	$291,752	$415,882	$415,882
1707010508	$879,033	$1,259,509	$939,623	$1,320,099	$1,000,213	$1,380,689
1707010511	$395,158	$395,158	$797,808	$797,808	$1,200,458	$1,200,458
1707010512	$103,903	$103,903	$211,237	$211,237	$318,570	$318,570
1707010513	$171,313	$171,313	$343,609	$343,609	$515,905	$515,905
1708000101	$211,825	$211,825	$417,157	$417,157	$622,489	$622,489

Lower Columbia River O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$127,371	$127,371	$231,720	$231,720	$336,069	$336,069
1708000103	$94,719	$94,719	$181,289	$181,289	$267,859	$267,859
1708000104	$61,923	$61,923	$158,331	$158,331	$254,738	$254,738
1708000105	$1,720,356	$1,578,607	$2,045,295	$1,903,546	$2,370,233	$2,228,485
1708000106	$139,115	$141,979	$371,139	$374,003	$603,164	$606,028
1708000107	$429,293	$429,293	$840,460	$840,460	$1,251,628	$1,251,628
1708000108	$51,075	$53,939	$175,403	$178,267	$299,731	$302,595
1708000109	$1,820,008	$1,834,327	$3,904,144	$3,918,463	$5,988,281	$6,002,599
1708000205	$471,095	$471,095	$825,934	$825,934	$1,180,773	$1,180,773
1708000206	$260,290	$262,788	$547,174	$549,672	$834,058	$836,556
1708000301	$305,071	$307,935	$571,406	$574,269	$837,741	$840,604
1708000401	$230,643	$230,643	$431,738	$431,738	$632,832	$632,832
1708000402	$2,413,913	$2,981,652	$2,694,275	$3,262,014	$2,974,637	$3,542,375
1708000403	$293,944	$293,944	$554,664	$554,664	$815,384	$815,384
1708000404	$499,115	$499,115	$937,266	$937,266	$1,375,418	$1,375,418
1708000405	$366,626	$366,626	$706,699	$706,699	$1,046,772	$1,046,772
1708000501	$105,147	$105,147	$187,398	$187,398	$269,650	$269,650
1708000502	$1,399,086	$516,811	$1,551,746	$669,471	$1,704,407	$822,131
1708000503	$227,420	$227,420	$592,113	$592,113	$956,805	$956,805
1708000504	$136,315	$136,315	$364,630	$364,630	$592,945	$592,945
1708000505	$59,412	$59,412	$113,712	$113,712	$168,012	$168,012
1708000506	$26,412	$26,412	$50,552	$50,552	$74,692	$74,692
1708000507	$171,547	$171,547	$370,319	$370,319	$569,091	$569,091
1708000508	$195,740	$195,740	$394,835	$394,835	$593,930	$593,930
1709000704	$371,985	$450,285	$507,257	$585,557	$642,528	$720,828
1709001101	$300,825	$300,825	$575,164	$575,164	$849,503	$849,503
1709001102	$291,221	$291,221	$557,390	$557,390	$823,559	$823,559
1709001103	$860,446	$968,468	$1,079,607	$1,187,629	$1,298,768	$1,406,790
1709001104	$1,855,632	$2,551,084	$2,223,748	$2,919,200	$2,591,864	$3,287,316
1709001105	$66,543	$66,543	$165,156	$165,156	$263,769	$263,769
1709001106	$618,423	$769,831	$870,896	$1,022,304	$1,123,370	$1,274,778
1709001201	$291,531	$300,123	$588,956	$597,547	$886,380	$894,972
1709001202	$275,817	$278,681	$587,388	$590,252	$898,959	$901,823
1709001203	$1,391,244	$1,405,563	$3,358,206	$3,372,525	$5,325,168	$5,339,487

Upper Willamette O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$69,133	$69,133	$110,336	$110,336	$151,539	$151,539
1709000304	$160,861	$172,316	$202,546	$214,002	$244,231	$255,687
1709000306	$38,195	$38,195	$160,430	$160,430	$282,664	$282,664
1709000504	$22,907	$22,907	$56,486	$56,486	$90,065	$90,065
1709000505	$151,918	$151,918	$290,765	$290,765	$429,613	$429,613
1709000506	$76,677	$79,541	$117,056	$119,919	$157,434	$160,298
1709000601	$73,635	$79,363	$122,403	$128,131	$171,172	$176,899
1709000602	$64,899	$64,899	$115,915	$115,915	$166,931	$166,931
1709000603	$41,147	$41,147	$90,510	$90,510	$139,873	$139,873
1709000606	$220,072	$220,072	$412,878	$412,878	$605,685	$605,685
1709000607	$1,389	$1,389	$4,019	$4,019	$6,648	$6,648
1709000608	$9,606	$9,606	$31,478	$31,478	$53,350	$53,350
1709000701	$312,252	$312,252	$695,124	$695,124	$1,077,996	$1,077,996
1709000702	$53,587	$56,451	$258,764	$261,628	$463,941	$466,805
1709000703	$155,331	$163,922	$357,295	$365,887	$559,260	$567,851
1709000704	$371,985	$450,285	$507,257	$585,557	$642,528	$720,828
1709000801	$99,744	$99,744	$162,287	$162,287	$224,830	$224,830
1709000802	$57,396	$57,396	$110,764	$110,764	$164,131	$164,131
1709000803	$39,178	$39,178	$84,755	$84,755	$130,332	$130,332
1709000804	$24,352	$24,352	$85,193	$85,193	$146,034	$146,034
1709000805	$4,293	$4,293	$175,103	$175,103	$345,912	$345,912
1709000806	$43,341	$43,341	$276,770	$276,770	$510,198	$510,198
1709000807	$27,158	$30,022	$128,790	$131,653	$230,421	$233,285
1709000901	$277,825	$280,688	$770,722	$773,586	$1,263,620	$1,266,484
1709000902	$20,625	$23,489	$78,302	$81,165	$135,978	$138,842
1709000903	$9,921	$9,921	$91,457	$91,457	$172,993	$172,993
1709000904	$9,591	$9,591	$85,852	$85,852	$162,114	$162,114
1709000905	$116,033	$116,033	$221,513	$221,513	$326,994	$326,994
1709000906	$22,227	$22,227	$111,254	$111,254	$200,281	$200,281
1709001001	$81,269	$84,132	$204,925	$207,789	$328,582	$331,446
1709001002	$27,858	$30,722	$138,761	$141,625	$249,663	$252,527
1709001003	$29,104	$29,104	$282,688	$282,688	$536,272	$536,272
1709001004	$153,890	$156,753	$312,407	$315,271	$470,925	$473,789
1709001005	$275,456	$278,320	$592,455	$595,319	$909,454	$912,318
1709001201	$291,531	$300,123	$588,956	$597,547	$886,380	$894,972
1709001203	$1,391,244	$1,405,563	$3,358,206	$3,372,525	$5,325,168	$5,339,487

Middle Columbia River O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$174,280	$180,008	$494,211	$499,939	$814,142	$819,869
1703000101	$666,131	$666,131	$2,155,444	$2,155,444	$3,644,758	$3,644,758
1703000102	$295,850	$295,850	$566,525	$566,525	$837,200	$837,200
1703000103	$699,497	$702,361	$1,380,788	$1,383,651	$2,062,078	$2,064,941
1703000104	$180,530	$180,530	$459,573	$459,573	$738,617	$738,617
1703000201	$637,744	$637,744	$1,324,346	$1,324,346	$2,010,948	$2,010,948
1703000202	$440,437	$440,437	$854,711	$854,711	$1,268,986	$1,268,986
1703000203	$1,119,594	$1,236,566	$2,149,358	$2,266,329	$3,179,121	$3,296,093
1703000301	$3,022	$3,022	$29,345	$29,345	$55,669	$55,669
1703000302	$195,741	$198,605	$422,724	$425,588	$649,706	$652,570
1703000303	$95,500	$95,500	$232,500	$232,500	$369,500	$369,500
1703000304	$86,817	$86,817	$188,849	$188,849	$290,882	$290,882
1703000305	$70,137	$70,137	$71,514	$71,514	$72,892	$72,892
1703000306	$94,840	$100,568	$394,164	$399,891	$693,488	$699,215
1703000307	$74,730	$74,730	$178,741	$178,741	$282,752	$282,752
1707010101	$491,755	$491,755	$1,061,614	$1,061,614	$1,631,473	$1,631,473
1707010102	$14,491	$14,491	$140,237	$140,237	$265,983	$265,983
1707010105	$1,142	$1,142	$28,846	$28,846	$56,550	$56,550
1707010106	$2,601	$2,601	$19,723	$19,723	$36,845	$36,845
1707010109	$41,815	$41,815	$56,761	$56,761	$71,706	$71,706
1707010110	$2,726	$2,726	$5,562	$5,562	$8,398	$8,398
1707010111	$1,459	$1,459	$2,975	$2,975	$4,492	$4,492
1707010112	$57,869	$57,869	$68,784	$68,784	$79,698	$79,698
1707010113	$10,849	$10,849	$23,468	$23,468	$36,087	$36,087
1707010114	$149,630	$152,494	$500,262	$503,126	$850,894	$853,757
1707010201	$149,084	$149,084	$269,242	$269,242	$389,400	$389,400
1707010202	$185,686	$188,550	$452,185	$455,049	$718,683	$721,547
1707010203	$104,567	$104,567	$204,598	$204,598	$304,630	$304,630
1707010204	$21,344	$21,344	$30,146	$30,146	$38,947	$38,947
1707010207	$65	$65	$133	$133	$201	$201
1707010208	$32,762	$32,762	$161,087	$161,087	$289,411	$289,411
1707010209	$53,047	$53,047	$86,218	$86,218	$119,389	$119,389
1707010210	$6,435	$6,435	$24,366	$24,366	$42,296	$42,296
1707010211	$162,399	$165,263	$322,222	$325,086	$482,045	$484,909
1707010301	$222,305	$222,305	$425,514	$425,514	$628,723	$628,723
1707010302	$207,838	$207,838	$402,652	$402,652	$597,466	$597,466
1707010303	$59,209	$59,209	$88,811	$88,811	$118,413	$118,413
1707010304	$365,790	$365,790	$858,455	$858,455	$1,351,120	$1,351,120
1707010305	$27,441	$27,441	$146,132	$146,132	$264,822	$264,822
1707010306	$303,683	$303,683	$714,279	$714,279	$1,124,875	$1,124,875

Middle Columbia River O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$25	$25	$1,426	$1,426	$2,827	$2,827
1707010308	$28,364	$31,228	$33,358	$36,222	$38,352	$41,215
1707010310	$18,690	$18,690	$19,412	$19,412	$20,133	$20,133
1707010313	$85,645	$88,509	$110,746	$113,609	$135,846	$138,710
1707010501	$198,075	$198,075	$373,628	$373,628	$549,180	$549,180
1707010502	$62,355	$62,355	$126,505	$126,505	$190,655	$190,655
1707010503	$66,305	$66,305	$130,490	$130,490	$194,675	$194,675
1707010504	$142,258	$147,985	$336,168	$341,896	$530,079	$535,806
1707010505	$3,854	$3,854	$21,840	$21,840	$39,826	$39,826
1707010512	$103,903	$103,903	$211,237	$211,237	$318,570	$318,570
1707010513	$171,313	$171,313	$343,609	$343,609	$515,905	$515,905
1707010601	$484	$484	$2,291	$2,291	$4,098	$4,098
1707010602	$21,432	$21,432	$33,385	$33,385	$45,338	$45,338
1707010603	$121,196	$121,196	$314,199	$314,199	$507,203	$507,203
1707010604	$100,521	$100,521	$259,886	$259,886	$419,250	$419,250
1707020103	$165,922	$165,922	$324,645	$324,645	$483,367	$483,367
1707020104	$133,554	$133,554	$268,430	$268,430	$403,305	$403,305
1707020105	$192,187	$192,187	$369,835	$369,835	$547,483	$547,483
1707020106	$89,256	$89,256	$181,602	$181,602	$273,947	$273,947
1707020107	$106,832	$106,832	$226,715	$226,715	$346,599	$346,599
1707020108	$104,313	$104,313	$242,209	$242,209	$380,105	$380,105
1707020109	$69,379	$69,379	$140,594	$140,594	$211,809	$211,809
1707020110	$73,107	$73,107	$148,786	$148,786	$224,466	$224,466
1707020111	$69,867	$69,867	$138,093	$138,093	$206,319	$206,319
1707020112	$116,100	$116,100	$222,210	$222,210	$328,320	$328,320
1707020113	$199,994	$199,994	$488,129	$488,129	$776,264	$776,264
1707020114	$83,426	$83,426	$201,165	$201,165	$318,904	$318,904
1707020115	$115,265	$115,265	$220,009	$220,009	$324,753	$324,753
1707020201	$153,423	$153,423	$302,006	$302,006	$450,589	$450,589
1707020202	$217,642	$217,642	$424,776	$424,776	$631,909	$631,909
1707020203	$292,695	$292,695	$560,519	$560,519	$828,343	$828,343
1707020204	$175,624	$175,624	$336,172	$336,172	$496,720	$496,720
1707020205	$254,253	$254,253	$488,564	$488,564	$722,876	$722,876
1707020206	$215,550	$215,550	$403,386	$403,386	$591,221	$591,221
1707020207	$322,328	$322,328	$627,648	$627,648	$932,967	$932,967
1707020208	$302,861	$302,861	$591,367	$591,367	$879,873	$879,873
1707020209	$77,755	$77,755	$155,395	$155,395	$233,035	$233,035
1707020210	$78,948	$78,948	$172,571	$172,571	$266,194	$266,194
1707020301	$123,174	$123,174	$262,613	$262,613	$402,052	$402,052
1707020302	$197,123	$197,123	$400,892	$400,892	$604,662	$604,662

Middle Columbia River O. mykiss ESU						
	Annual Total Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$129,762	$129,762	$256,758	$256,758	$383,753	$383,753
1707020304	$59,156	$59,156	$122,673	$122,673	$186,190	$186,190
1707020305	$8,118	$8,118	$15,545	$15,545	$22,972	$22,972
1707020401	$150,215	$150,215	$301,899	$301,899	$453,583	$453,583
1707020402	$101,779	$101,779	$205,173	$205,173	$308,568	$308,568
1707020403	$235,457	$235,457	$471,401	$471,401	$707,345	$707,345
1707020404	$134,510	$134,510	$288,566	$288,566	$442,621	$442,621
1707020405	$89,997	$89,997	$172,252	$172,252	$254,506	$254,506
1707020406	$7,976	$7,976	$8,895	$8,895	$9,814	$9,814
1707020407	$36,860	$36,860	$70,548	$70,548	$104,236	$104,236
1707020408	$36,388	$36,388	$67,278	$67,278	$98,167	$98,167
1707020409	$90,730	$90,730	$173,655	$173,655	$256,579	$256,579
1707020410	$72,414	$72,414	$165,264	$165,264	$258,115	$258,115
1707020411	$503,935	$503,935	$1,093,416	$1,093,416	$1,682,896	$1,682,896
1707020412	$69,071	$69,071	$134,564	$134,564	$200,057	$200,057
1707020413	$3,949	$3,949	$6,352	$6,352	$8,754	$8,754
1707020414	$10,573	$10,573	$20,240	$20,240	$29,908	$29,908
1707030603	$1,208,767	$1,542,991	$1,219,461	$1,553,685	$1,230,155	$1,564,379
1707030604	$9,627	$9,627	$18,427	$18,427	$27,226	$27,226
1707030605	$16,262	$16,262	$19,890	$19,890	$23,518	$23,518
1707030606	$30,276	$30,276	$59,306	$59,306	$88,337	$88,337
1707030607	$44,164	$44,164	$112,556	$112,556	$180,947	$180,947
1707030608	$5,522	$5,522	$10,570	$10,570	$15,617	$15,617
1707030610	$341,774	$341,774	$905,133	$905,133	$1,468,492	$1,468,492
1707030611	$20,630	$20,630	$118,019	$118,019	$215,407	$215,407
1707030612	$73,246	$73,246	$140,192	$140,192	$207,138	$207,138
1707030701	$81,048	$81,048	$165,495	$165,495	$249,942	$249,942
1707030702	$43,846	$43,846	$67,205	$67,205	$90,564	$90,564
1707030704	$25,075	$25,075	$50,745	$50,745	$76,414	$76,414
1707030705	$9,259	$9,259	$17,721	$17,721	$26,184	$26,184
1708000107	$429,293	$429,293	$840,460	$840,460	$1,251,628	$1,251,628

Appendix F.2
Annual Hydropower Dam Impact by Watershed

Puget Sound chinook salmon ESU						
	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$0	$0	$0	$0	$0	$0
1711000202	$0	$0	$0	$0	$0	$0
1711000204	$0	$0	$0	$0	$0	$0
1711000401	$84,820	$84,820	$84,820	$84,820	$84,820	$84,820
1711000402	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1711000403	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1711000404	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1711000405	$0	$0	$0	$0	$0	$0
1711000504	$2,732,393	$1,963,705	$2,732,393	$1,963,705	$2,732,393	$1,963,705
1711000505	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711000506	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1711000507	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711000508	$3,981,254	$5,771,695	$3,981,254	$5,771,695	$3,981,254	$5,771,695
1711000601	$74,218	$74,218	$74,218	$74,218	$74,218	$74,218
1711000602	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711000603	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1711000604	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1711000701	$53,013	$53,013	$53,013	$53,013	$53,013	$53,013
1711000702	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711000801	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1711000802	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1711000803	$0	$0	$0	$0	$0	$0
1711000901	$127,230	$127,230	$127,230	$127,230	$127,230	$127,230
1711000902	$106,025	$106,025	$106,025	$106,025	$106,025	$106,025
1711000903	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1711000904	$2,050,457	$2,504,401	$2,050,457	$2,504,401	$2,050,457	$2,504,401
1711000905	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001003	$1,804,804	$2,840,289	$1,804,804	$2,840,289	$1,804,804	$2,840,289
1711001004	$119,505	$91,659	$119,505	$91,659	$119,505	$91,659
1711001101	$0	$0	$0	$0	$0	$0
1711001102	$0	$0	$0	$0	$0	$0
1711001201	$2,521,804	$4,021,521	$2,521,804	$4,021,521	$2,521,804	$4,021,521
1711001202	$0	$0	$0	$0	$0	$0
1711001203	$0	$0	$0	$0	$0	$0
1711001204	$0	$0	$0	$0	$0	$0
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$0	$0	$0	$0	$0	$0
1711001303	$0	$0	$0	$0	$0	$0
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$443,901	$144,868	$443,901	$144,868	$443,901	$144,868
1711001403	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001404	$1,544,498	$2,463,011	$1,544,498	$2,463,011	$1,544,498	$2,463,011
1711001405	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001502	$0	$0	$0	$0	$0	$0
1711001503	$33,635	$33,635	$33,635	$33,635	$33,635	$33,635
1711001601	$0	$0	$0	$0	$0	$0
1711001602	$0	$0	$0	$0	$0	$0
1711001701	$493,683	$493,683	$493,683	$493,683	$493,683	$493,683
1711001802	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001806	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001808	$0	$0	$0	$0	$0	$0
1711001900	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001901	$0	$0	$0	$0	$0	$0
1711001902	$0	$0	$0	$0	$0	$0
1711001904	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$0	$0	$0	$0
1711002004	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711002007	$3,261,138	$3,261,138	$3,261,138	$3,261,138	$3,261,138	$3,261,138
N01	$0	$0	$0	$0	$0	$0
N02	$0	$0	$0	$0	$0	$0
N03	$0	$0	$0	$0	$0	$0
N04	$0	$0	$0	$0	$0	$0
N05	$0	$0	$0	$0	$0	$0
N06	$0	$0	$0	$0	$0	$0
N07	$0	$0	$0	$0	$0	$0
N08	$0	$0	$0	$0	$0	$0
N09	$0	$0	$0	$0	$0	$0
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$0	$0	$0	$0	$0	$0
N13	$0	$0	$0	$0	$0	$0
N14	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
Watershed	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1707010507	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1707010508	$823,592	$1,201,203	$823,592	$1,201,203	$823,592	$1,201,203
1707010509	$889,829	$1,529,544	$889,829	$1,529,544	$889,829	$1,529,544
1707010510	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$1,477,661	$1,335,912	$1,477,661	$1,335,912	$1,477,661	$1,335,912
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$0	$0	$0	$0	$0	$0
1708000205	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1708000206	$26,435	$28,934	$26,435	$28,934	$26,435	$28,934
1708000301	$0	$0	$0	$0	$0	$0
1708000302	$0	$0	$0	$0	$0	$0
1708000303	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$2,111,971	$2,679,709	$2,111,971	$2,679,709	$2,111,971	$2,679,709
1708000403	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1708000404	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$1,369,745	$487,470	$1,369,745	$487,470	$1,369,745	$487,470
1708000503	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1708000601	$0	$0	$0	$0	$0	$0
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0
1709000704	$248,899	$315,744	$248,899	$315,744	$248,899	$315,744
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$540,150	$688,694	$540,150	$688,694	$540,150	$688,694
1709001201	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1709001202	$0	$0	$0	$0	$0	$0
1709001203	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603

Upper Willamette River chinook salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$0	$0	$0	$0
1709000201	$0	$0	$0	$0	$0	$0
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$0	$0	$0	$0	$0	$0
1709000205	$0	$0	$0	$0	$0	$0
1709000301	$0	$0	$0	$0	$0	$0
1709000302	$0	$0	$0	$0	$0	$0
1709000303	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603

Upper Willamette River chinook salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$0	$0	$0	$0	$0	$0
1709000305	$0	$0	$0	$0	$0	$0
1709000306	$0	$0	$0	$0	$0	$0
1709000401	$2,425,949	$3,317,893	$2,425,949	$3,317,893	$2,425,949	$3,317,893
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$148,315	$67,271	$148,315	$67,271	$148,315	$67,271
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$0	$0	$0	$0
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$0	$0	$0	$0
1709000704	$248,899	$315,744	$248,899	$315,744	$248,899	$315,744
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$620,653	$728,675	$620,653	$728,675	$620,653	$728,675
1709001104	$1,455,838	$2,151,290	$1,455,838	$2,151,290	$1,455,838	$2,151,290
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$540,150	$688,694	$540,150	$688,694	$540,150	$688,694
1709001201	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205

Upper Willamette River chinook salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$0	$0	$0	$0	$0	$0
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1702001103	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1702001104	$0	$0	$0	$0	$0	$0
1702001105	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$0	$0	$0	$0	$0	$0
1710020201	$0	$0	$0	$0	$0	$0
1710020202	$0	$0	$0	$0	$0	$0
1710020203	$0	$0	$0	$0	$0	$0
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$0	$0	$0	$0
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$0	$0	$0	$0	$0	$0
1710020303	$0	$0	$0	$0	$0	$0
1710020304	$0	$0	$0	$0	$0	$0
1710020305	$0	$0	$0	$0	$0	$0
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$0	$0	$0	$0	$0	$0
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$0	$0	$0	$0	$0	$0
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$0	$0	$0	$0	$0	$0
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$0	$0	$0	$0	$0	$0
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$0	$0	$0	$0	$0	$0
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$0	$0	$0	$0	$0	$0
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$0	$0	$0	$0	$0	$0
1710030112	$0	$0	$0	$0	$0	$0
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$0	$0	$0	$0	$0	$0
1710030207	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$0	$0	$0	$0
1710030210	$0	$0	$0	$0	$0	$0
1710030211	$0	$0	$0	$0	$0	$0
1710030212	$0	$0	$0	$0	$0	$0
1710030213	$0	$0	$0	$0	$0	$0
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$0	$0	$0	$0	$0	$0
1710030303	$0	$0	$0	$0	$0	$0
1710030304	$0	$0	$0	$0	$0	$0
1710030305	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1710030308	$0	$0	$0	$0	$0	$0
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$0	$0	$0	$0
1710030404	$0	$0	$0	$0	$0	$0
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$0	$0	$0	$0	$0	$0
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$0	$0	$0	$0	$0	$0
1710030506	$0	$0	$0	$0	$0	$0
1710030603	$0	$0	$0	$0	$0	$0
1710030604	$0	$0	$0	$0	$0	$0

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$493,683	$493,683	$493,683	$493,683	$493,683	$493,683
1711001802	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001806	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1711001807	$0	$0	$0	$0	$0	$0
1711001808	$0	$0	$0	$0	$0	$0
1711001908	$0	$0	$0	$0	$0	$0
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$889,829	$1,529,544	$889,829	$1,529,544	$889,829	$1,529,544
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000109	$0	$0	$0	$0	$0	$0
1708000205	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1708000206	$26,435	$28,934	$26,435	$28,934	$26,435	$28,934
1708000301	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0

Ozette Lake sockeye salmon ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$0	$0	$0	$0	$0	$0
1702000504	$0	$0	$0	$0	$0	$0
1702000505	$0	$0	$0	$0	$0	$0
1702000601	$0	$0	$0	$0	$0	$0
1702000602	$0	$0	$0	$0	$0	$0
1702000603	$0	$0	$0	$0	$0	$0
1702000604	$0	$0	$0	$0	$0	$0
1702000605	$0	$0	$0	$0	$0	$0
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$0	$0	$0	$0	$0	$0
1702000903	$2,521,804	$4,021,521	$2,521,804	$4,021,521	$2,521,804	$4,021,521
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$0	$0	$0	$0	$0	$0
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1702001103	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1702001104	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$0	$0	$0	$0	$0	$0
1702001204	$0	$0	$0	$0	$0	$0
1702001509	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$0	$0	$0	$0	$0	$0
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$0	$0	$0	$0
1706010406	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$0	$0	$0	$0	$0	$0
1706010501	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$0	$0	$0	$0	$0	$0
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$0	$0	$0	$0	$0	$0
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$0	$0	$0	$0	$0	$0
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$0	$0	$0	$0	$0	$0
1706020104	$0	$0	$0	$0	$0	$0
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$0	$0	$0	$0	$0	$0
1706020113	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$0	$0	$0	$0	$0	$0
1706020117	$0	$0	$0	$0	$0	$0
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$0	$0	$0	$0	$0	$0
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$0	$0	$0	$0	$0	$0
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020307	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020308	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1706020309	$0	$0	$0	$0	$0	$0
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$0	$0	$0	$0
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$0	$0	$0	$0	$0	$0
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020801	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$0	$0	$0	$0
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$0	$0	$0	$0	$0	$0
1706020912	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1706020913	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1706021002	$0	$0	$0	$0	$0	$0
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$0	$0	$0	$0	$0	$0
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$0	$0	$0	$0	$0	$0
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$0	$0	$0	$0	$0	$0
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$0	$0	$0	$0	$0	$0
1706030613	$0	$0	$0	$0	$0	$0
1706030614	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1706030615	$0	$0	$0	$0	$0	$0
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$0	$0	$0	$0	$0	$0
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$0	$0	$0	$0	$0	$0
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1707010507	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1707010508	$823,592	$1,201,203	$823,592	$1,201,203	$823,592	$1,201,203
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$1,477,661	$1,335,912	$1,477,661	$1,335,912	$1,477,661	$1,335,912
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$0	$0	$0	$0	$0	$0
1708000205	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1708000206	$26,435	$28,934	$26,435	$28,934	$26,435	$28,934
1708000301	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$2,111,971	$2,679,709	$2,111,971	$2,679,709	$2,111,971	$2,679,709
1708000403	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1708000404	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$1,369,745	$487,470	$1,369,745	$487,470	$1,369,745	$487,470
1708000503	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1709000704	$248,899	$315,744	$248,899	$315,744	$248,899	$315,744
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$620,653	$728,675	$620,653	$728,675	$620,653	$728,675
1709001104	$1,455,838	$2,151,290	$1,455,838	$2,151,290	$1,455,838	$2,151,290
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$540,150	$688,694	$540,150	$688,694	$540,150	$688,694
1709001201	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1709001202	$0	$0	$0	$0	$0	$0
1709001203	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603

Upper Willamette O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709000304	$0	$0	$0	$0	$0	$0
1709000306	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$0	$0	$0	$0
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$0	$0	$0	$0
1709000704	$248,899	$315,744	$248,899	$315,744	$248,899	$315,744
1709000801	$0	$0	$0	$0	$0	$0
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001001	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709001002	$0	$0	$0	$0	$0	$0
1709001003	$0	$0	$0	$0	$0	$0
1709001004	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1709001005	$0	$0	$0	$0	$0	$0
1709001201	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1709001203	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603

Middle Columbia River O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$31,808	$31,808	$31,808	$31,808	$31,808	$31,808
1703000101	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1703000102	$0	$0	$0	$0	$0	$0
1703000103	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1703000104	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$239,100	$356,072	$239,100	$356,072	$239,100	$356,072
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$0	$0	$0	$0	$0	$0
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$0	$0	$0	$0	$0	$0
1703000307	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$0	$0	$0	$0	$0	$0
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$0	$0	$0	$0	$0	$0
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$0	$0	$0	$0	$0	$0
1707010209	$0	$0	$0	$0	$0	$0
1707010210	$0	$0	$0	$0	$0	$0
1707010211	$0	$0	$0	$0	$0	$0
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$0	$0	$0	$0	$0	$0
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010501	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$0	$0	$0	$0
1707010505	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$21,205	$21,205	$21,205	$21,205	$21,205	$21,205
1707010603	$0	$0	$0	$0	$0	$0
1707010604	$0	$0	$0	$0	$0	$0
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$0	$0	$0	$0
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$0	$0	$0	$0	$0	$0
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$0	$0	$0	$0	$0	$0
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$0	$0	$0	$0	$0	$0
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$1,191,482	$1,525,706	$1,191,482	$1,525,706	$1,191,482	$1,525,706
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$10,603	$10,603	$10,603	$10,603	$10,603	$10,603
1707030611	$0	$0	$0	$0	$0	$0
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Appendix F.3
Annual Non-hydropower Dam Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$2,040	$2,040	$180,243	$180,243	$358,445	$358,445
1711000202	$720	$720	$63,615	$63,615	$126,510	$126,510
1711000204	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$120	$120	$10,603	$10,603	$21,085	$21,085
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$0	$0	$0	$0	$0	$0
1711000405	$360	$360	$31,808	$31,808	$63,255	$63,255
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$0	$0	$0	$0	$0	$0
1711000506	$0	$0	$0	$0	$0	$0
1711000507	$120	$120	$10,603	$10,603	$21,085	$21,085
1711000508	$0	$0	$0	$0	$0	$0
1711000601	$0	$0	$0	$0	$0	$0
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$0	$0	$0	$0
1711000604	$240	$240	$21,205	$21,205	$42,170	$42,170
1711000701	$3,840	$3,840	$339,280	$339,280	$674,720	$674,720
1711000702	$600	$600	$53,013	$53,013	$105,425	$105,425
1711000801	$0	$0	$0	$0	$0	$0
1711000802	$360	$360	$31,808	$31,808	$63,255	$63,255
1711000803	$120	$120	$10,603	$10,603	$21,085	$21,085
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$0	$0	$0	$0	$0	$0
1711000903	$240	$240	$21,205	$21,205	$42,170	$42,170
1711000904	$1,560	$1,560	$137,833	$137,833	$274,105	$274,105
1711000905	$0	$0	$0	$0	$0	$0
1711001003	$600	$600	$53,013	$53,013	$105,425	$105,425
1711001004	$720	$720	$63,615	$63,615	$126,510	$126,510
1711001101	$240	$240	$21,205	$21,205	$42,170	$42,170
1711001102	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1711001201	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1711001202	$720	$720	$63,615	$63,615	$126,510	$126,510
1711001203	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1711001204	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1711001303	$5,520	$5,520	$487,715	$487,715	$969,910	$969,910
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$2,640	$2,640	$233,255	$233,255	$463,870	$463,870
1711001403	$120	$120	$10,603	$10,603	$21,085	$21,085
1711001404	$0	$0	$0	$0	$0	$0
1711001405	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1711001502	$0	$0	$0	$0	$0	$0
1711001503	$1,680	$1,680	$148,435	$148,435	$295,190	$295,190
1711001601	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1711001602	$240	$240	$21,205	$21,205	$42,170	$42,170
1711001701	$120	$120	$10,603	$10,603	$21,085	$21,085
1711001802	$120	$120	$10,603	$10,603	$21,085	$21,085
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$120	$120	$10,603	$10,603	$21,085	$21,085
1711001808	$960	$960	$84,820	$84,820	$168,680	$168,680
1711001900	$840	$840	$74,218	$74,218	$147,595	$147,595
1711001901	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275
1711001902	$240	$240	$21,205	$21,205	$42,170	$42,170
1711001904	$840	$840	$74,218	$74,218	$147,595	$147,595
1711002003	$240	$240	$21,205	$21,205	$42,170	$42,170
1711002004	$240	$240	$21,205	$21,205	$42,170	$42,170
1711002007	$0	$0	$0	$0	$0	$0
N01	$0	$0	$0	$0	$0	$0
N02	$0	$0	$0	$0	$0	$0
N03	$0	$0	$0	$0	$0	$0
N04	$0	$0	$0	$0	$0	$0
N05	$0	$0	$0	$0	$0	$0
N06	$0	$0	$0	$0	$0	$0
N07	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
N08	$0	$0	$0	$0	$0	$0
N09	$0	$0	$0	$0	$0	$0
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$120	$120	$10,603	$10,603	$21,085	$21,085
N13	$0	$0	$0	$0	$0	$0
N14	$120	$120	$10,603	$10,603	$21,085	$21,085
N15	$2,640	$2,640	$233,255	$233,255	$463,870	$463,870

Puget Sound chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$480	$480	$42,410	$42,410	$84,340	$84,340
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000101	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000105	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1708000106	$360	$360	$31,808	$31,808	$63,255	$63,255
1708000107	$240	$240	$21,205	$21,205	$42,170	$42,170
1708000108	$480	$480	$42,410	$42,410	$84,340	$84,340
1708000109	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000205	$840	$840	$74,218	$74,218	$147,595	$147,595
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000302	$0	$0	$0	$0	$0	$0
1708000303	$0	$0	$0	$0	$0	$0
1708000304	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1708000503	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275
1708000504	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1708000508	$240	$240	$21,205	$21,205	$42,170	$42,170
1708000601	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1708000602	$360	$360	$31,808	$31,808	$63,255	$63,255
1708000603	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000704	$600	$600	$53,013	$53,013	$105,425	$105,425
1709001105	$120	$120	$10,603	$10,603	$21,085	$21,085
1709001106	$960	$960	$84,820	$84,820	$168,680	$168,680
1709001201	$360	$360	$31,808	$31,808	$63,255	$63,255
1709001202	$360	$360	$31,808	$31,808	$63,255	$63,255
1709001203	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275

Upper Willamette River chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1709000105	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1709000110	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000201	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1709000202	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000203	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1709000205	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000301	$3,360	$3,360	$296,870	$296,870	$590,380	$590,380
1709000302	$480	$480	$42,410	$42,410	$84,340	$84,340
1709000303	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$0	$0	$0	$0	$0	$0
1709000305	$840	$840	$74,218	$74,218	$147,595	$147,595
1709000306	$960	$960	$84,820	$84,820	$168,680	$168,680
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000504	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000601	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000701	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000702	$2,040	$2,040	$180,243	$180,243	$358,445	$358,445
1709000703	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1709000704	$600	$600	$53,013	$53,013	$105,425	$105,425
1709000804	$360	$360	$31,808	$31,808	$63,255	$63,255
1709000805	$1,920	$1,920	$169,640	$169,640	$337,360	$337,360
1709000806	$2,160	$2,160	$190,845	$190,845	$379,530	$379,530
1709000807	$960	$960	$84,820	$84,820	$168,680	$168,680
1709000901	$1,680	$1,680	$148,435	$148,435	$295,190	$295,190
1709000902	$480	$480	$42,410	$42,410	$84,340	$84,340
1709000903	$840	$840	$74,218	$74,218	$147,595	$147,595
1709000904	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$240	$240	$21,205	$21,205	$42,170	$42,170
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$120	$120	$10,603	$10,603	$21,085	$21,085
1709001106	$960	$960	$84,820	$84,820	$168,680	$168,680
1709001201	$360	$360	$31,808	$31,808	$63,255	$63,255

Upper Willamette River chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$120	$120	$10,603	$10,603	$21,085	$21,085
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1702000807	$120	$120	$10,603	$10,603	$21,085	$21,085
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$4,560	$4,560	$402,895	$402,895	$801,230	$801,230
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$720	$720	$63,615	$63,615	$126,510	$126,510
1702001105	$240	$240	$21,205	$21,205	$42,170	$42,170
1702001604	$120	$120	$10,603	$10,603	$21,085	$21,085
1702001605	$120	$120	$10,603	$10,603	$21,085	$21,085
1702001606	$480	$480	$42,410	$42,410	$84,340	$84,340
1707010101	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010102	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1707010106	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010109	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010114	$720	$720	$63,615	$63,615	$126,510	$126,510
1707010501	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010504	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000107	$240	$240	$21,205	$21,205	$42,170	$42,170

Oregon Coast coho salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020201	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020202	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020203	$0	$0	$0	$0	$0	$0
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$0	$0	$0	$0
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$0	$0	$0	$0	$0	$0
1710020303	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020304	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1710020305	$0	$0	$0	$0	$0	$0
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$0	$0	$0	$0	$0	$0
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$240	$240	$21,205	$21,205	$42,170	$42,170
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$120	$120	$10,603	$10,603	$21,085	$21,085
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$2,400	$2,400	$212,050	$212,050	$421,700	$421,700
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$360	$360	$31,808	$31,808	$63,255	$63,255
1710030112	$2,040	$2,040	$180,243	$180,243	$358,445	$358,445
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$120	$120	$10,603	$10,603	$21,085	$21,085
1710030207	$240	$240	$21,205	$21,205	$42,170	$42,170
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$0	$0	$0	$0
1710030210	$360	$360	$31,808	$31,808	$63,255	$63,255
1710030211	$0	$0	$0	$0	$0	$0
1710030212	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1710030213	$600	$600	$53,013	$53,013	$105,425	$105,425
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$120	$120	$10,603	$10,603	$21,085	$21,085
1710030303	$1,080	$1,080	$95,423	$95,423	$189,765	$189,765
1710030304	$120	$120	$10,603	$10,603	$21,085	$21,085
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$0	$0	$0	$0	$0	$0
1710030308	$120	$120	$10,603	$10,603	$21,085	$21,085
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$360	$360	$31,808	$31,808	$63,255	$63,255
1710030404	$720	$720	$63,615	$63,615	$126,510	$126,510
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$120	$120	$10,603	$10,603	$21,085	$21,085
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$120	$120	$10,603	$10,603	$21,085	$21,085
1710030506	$480	$480	$42,410	$42,410	$84,340	$84,340
1710030603	$120	$120	$10,603	$10,603	$21,085	$21,085
1710030604	$0	$0	$0	$0	$0	$0

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$120	$120	$10,603	$10,603	$21,085	$21,085
1711001802	$120	$120	$10,603	$10,603	$21,085	$21,085
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$120	$120	$10,603	$10,603	$21,085	$21,085
1711001807	$240	$240	$21,205	$21,205	$42,170	$42,170
1711001808	$960	$960	$84,820	$84,820	$168,680	$168,680
1711001908	$120	$120	$10,603	$10,603	$21,085	$21,085
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$0	$0	$0	$0	$0	$0
1711002003	$240	$240	$21,205	$21,205	$42,170	$42,170
N15	$2,640	$2,640	$233,255	$233,255	$463,870	$463,870
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000106	$360	$360	$31,808	$31,808	$63,255	$63,255
1708000107	$240	$240	$21,205	$21,205	$42,170	$42,170
1708000109	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000205	$840	$840	$74,218	$74,218	$147,595	$147,595
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000304	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275
1708000504	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1708000508	$240	$240	$21,205	$21,205	$42,170	$42,170

Columbia River chum salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$360	$360	$31,808	$31,808	$63,255	$63,255
1708000603	$240	$240	$21,205	$21,205	$42,170	$42,170

Ozette Lake sockeye salmon ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$120	$120	$10,603	$10,603	$21,085	$21,085
1702000504	$0	$0	$0	$0	$0	$0
1702000505	$0	$0	$0	$0	$0	$0
1702000601	$2,640	$2,640	$233,255	$233,255	$463,870	$463,870
1702000602	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1702000603	$2,520	$2,520	$222,653	$222,653	$442,785	$442,785
1702000604	$360	$360	$31,808	$31,808	$63,255	$63,255
1702000605	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1702000704	$240	$240	$21,205	$21,205	$42,170	$42,170
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$120	$120	$10,603	$10,603	$21,085	$21,085
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1702000807	$120	$120	$10,603	$10,603	$21,085	$21,085
1702000903	$480	$480	$42,410	$42,410	$84,340	$84,340
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$4,560	$4,560	$402,895	$402,895	$801,230	$801,230
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$720	$720	$63,615	$63,615	$126,510	$126,510

Upper Columbia River O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$240	$240	$21,205	$21,205	$42,170	$42,170
1702001204	$120	$120	$10,603	$10,603	$21,085	$21,085
1702001509	$6,480	$6,480	$572,535	$572,535	$1,138,590	$1,138,590
1702001604	$120	$120	$10,603	$10,603	$21,085	$21,085
1702001605	$120	$120	$10,603	$10,603	$21,085	$21,085
1702001606	$480	$480	$42,410	$42,410	$84,340	$84,340
1707010101	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010102	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1707010106	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010109	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010114	$720	$720	$63,615	$63,615	$126,510	$126,510
1707010501	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010504	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000107	$240	$240	$21,205	$21,205	$42,170	$42,170

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$480	$480	$42,410	$42,410	$84,340	$84,340
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1706010403	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010406	$120	$120	$10,603	$10,603	$21,085	$21,085

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$840	$840	$74,218	$74,218	$147,595	$147,595
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$240	$240	$21,205	$21,205	$42,170	$42,170
1706010410	$240	$240	$21,205	$21,205	$42,170	$42,170
1706010411	$0	$0	$0	$0	$0	$0
1706010501	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010502	$360	$360	$31,808	$31,808	$63,255	$63,255
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$0	$0	$0	$0	$0	$0
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$120	$120	$10,603	$10,603	$21,085	$21,085
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$0	$0	$0	$0	$0	$0
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$240	$240	$21,205	$21,205	$42,170	$42,170
1706020101	$0	$0	$0	$0	$0	$0
1706020104	$0	$0	$0	$0	$0	$0
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$120	$120	$10,603	$10,603	$21,085	$21,085
1706020113	$240	$240	$21,205	$21,205	$42,170	$42,170

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$0	$0	$0	$0	$0	$0
1706020117	$0	$0	$0	$0	$0	$0
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$0	$0	$0	$0	$0	$0
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$3,600	$3,600	$318,075	$318,075	$632,550	$632,550
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$2,520	$2,520	$222,653	$222,653	$442,785	$442,785
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$360	$360	$31,808	$31,808	$63,255	$63,255
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$120	$120	$10,603	$10,603	$21,085	$21,085
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$120	$120	$10,603	$10,603	$21,085	$21,085
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$240	$240	$21,205	$21,205	$42,170	$42,170
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$240	$240	$21,205	$21,205	$42,170	$42,170
1706020407	$120	$120	$10,603	$10,603	$21,085	$21,085
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$480	$480	$42,410	$42,410	$84,340	$84,340
1706020605	$240	$240	$21,205	$21,205	$42,170	$42,170
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$120	$120	$10,603	$10,603	$21,085	$21,085
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$0	$0
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$0	$0	$0	$0	$0	$0
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$0	$0	$0	$0
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$0	$0	$0	$0	$0	$0
1706020912	$0	$0	$0	$0	$0	$0
1706020913	$0	$0	$0	$0	$0	$0
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$120	$120	$10,603	$10,603	$21,085	$21,085
1706021001	$0	$0	$0	$0	$0	$0
1706021002	$120	$120	$10,603	$10,603	$21,085	$21,085
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$120	$120	$10,603	$10,603	$21,085	$21,085
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$0	$0	$0	$0	$0	$0
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$0	$0	$0	$0	$0	$0
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$360	$360	$31,808	$31,808	$63,255	$63,255
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$120	$120	$10,603	$10,603	$21,085	$21,085
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$120	$120	$10,603	$10,603	$21,085	$21,085

Snake River Basin O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$0	$0	$0	$0	$0	$0
1706030613	$0	$0	$0	$0	$0	$0
1706030614	$0	$0	$0	$0	$0	$0
1706030615	$0	$0	$0	$0	$0	$0
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$0	$0	$0	$0	$0	$0
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1706030631	$0	$0	$0	$0	$0	$0
1706030801	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010101	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010102	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1707010106	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010109	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010114	$720	$720	$63,615	$63,615	$126,510	$126,510
1707010501	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010504	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000107	$240	$240	$21,205	$21,205	$42,170	$42,170

Lower Columbia River O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010511	$480	$480	$42,410	$42,410	$84,340	$84,340
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000101	$120	$120	$10,603	$10,603	$21,085	$21,085

Lower Columbia River O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000105	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1708000106	$360	$360	$31,808	$31,808	$63,255	$63,255
1708000107	$240	$240	$21,205	$21,205	$42,170	$42,170
1708000108	$480	$480	$42,410	$42,410	$84,340	$84,340
1708000109	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000205	$840	$840	$74,218	$74,218	$147,595	$147,595
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$120	$120	$10,603	$10,603	$21,085	$21,085
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1708000503	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275
1708000504	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1708000508	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000704	$600	$600	$53,013	$53,013	$105,425	$105,425
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$120	$120	$10,603	$10,603	$21,085	$21,085
1709001106	$960	$960	$84,820	$84,820	$168,680	$168,680
1709001201	$360	$360	$31,808	$31,808	$63,255	$63,255
1709001202	$360	$360	$31,808	$31,808	$63,255	$63,255
1709001203	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275

Upper Willamette O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$0	$0	$0	$0	$0	$0
1709000304	$0	$0	$0	$0	$0	$0
1709000306	$960	$960	$84,820	$84,820	$168,680	$168,680
1709000504	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000601	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000701	$240	$240	$21,205	$21,205	$42,170	$42,170
1709000702	$2,040	$2,040	$180,243	$180,243	$358,445	$358,445
1709000703	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1709000704	$600	$600	$53,013	$53,013	$105,425	$105,425
1709000801	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000804	$360	$360	$31,808	$31,808	$63,255	$63,255
1709000805	$1,920	$1,920	$169,640	$169,640	$337,360	$337,360
1709000806	$2,160	$2,160	$190,845	$190,845	$379,530	$379,530
1709000807	$960	$960	$84,820	$84,820	$168,680	$168,680
1709000901	$1,680	$1,680	$148,435	$148,435	$295,190	$295,190
1709000902	$480	$480	$42,410	$42,410	$84,340	$84,340
1709000903	$840	$840	$74,218	$74,218	$147,595	$147,595
1709000904	$120	$120	$10,603	$10,603	$21,085	$21,085
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$240	$240	$21,205	$21,205	$42,170	$42,170
1709001001	$1,080	$1,080	$95,423	$95,423	$189,765	$189,765
1709001002	$600	$600	$53,013	$53,013	$105,425	$105,425
1709001003	$2,760	$2,760	$243,858	$243,858	$484,955	$484,955
1709001004	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1709001005	$0	$0	$0	$0	$0	$0
1709001201	$360	$360	$31,808	$31,808	$63,255	$63,255
1709001203	$1,800	$1,800	$159,038	$159,038	$316,275	$316,275

Middle Columbia River O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$480	$480	$42,410	$42,410	$84,340	$84,340
1703000101	$9,720	$9,720	$858,803	$858,803	$1,707,885	$1,707,885
1703000102	$360	$360	$31,808	$31,808	$63,255	$63,255
1703000103	$360	$360	$31,808	$31,808	$63,255	$63,255
1703000104	$1,440	$1,440	$127,230	$127,230	$253,020	$253,020
1703000201	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1703000202	$120	$120	$10,603	$10,603	$21,085	$21,085
1703000203	$2,520	$2,520	$222,653	$222,653	$442,785	$442,785
1703000301	$240	$240	$21,205	$21,205	$42,170	$42,170
1703000302	$120	$120	$10,603	$10,603	$21,085	$21,085
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$120	$120	$10,603	$10,603	$21,085	$21,085
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$2,040	$2,040	$180,243	$180,243	$358,445	$358,445
1703000307	$240	$240	$21,205	$21,205	$42,170	$42,170
1707010101	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010102	$1,320	$1,320	$116,628	$116,628	$231,935	$231,935
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010109	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$0	$0	$0	$0	$0	$0
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$720	$720	$63,615	$63,615	$126,510	$126,510
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$0	$0	$0	$0	$0	$0
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1707010209	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010210	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010211	$0	$0	$0	$0	$0	$0
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$0	$0	$0	$0	$0	$0
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$1,200	$1,200	$106,025	$106,025	$210,850	$210,850
1707010306	$240	$240	$21,205	$21,205	$42,170	$42,170

Middle Columbia River O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010501	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$0	$0	$0	$0	$0	$0
1707010504	$360	$360	$31,808	$31,808	$63,255	$63,255
1707010505	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$120	$120	$10,603	$10,603	$21,085	$21,085
1707010603	$480	$480	$42,410	$42,410	$84,340	$84,340
1707010604	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020108	$360	$360	$31,808	$31,808	$63,255	$63,255
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$360	$360	$31,808	$31,808	$63,255	$63,255
1707020114	$480	$480	$42,410	$42,410	$84,340	$84,340
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$240	$240	$21,205	$21,205	$42,170	$42,170
1707020207	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020208	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$240	$240	$21,205	$21,205	$42,170	$42,170
1707020301	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Non-hydropower Dam Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020402	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020403	$240	$240	$21,205	$21,205	$42,170	$42,170
1707020404	$360	$360	$31,808	$31,808	$63,255	$63,255
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$120	$120	$10,603	$10,603	$21,085	$21,085
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$0	$0	$0	$0	$0	$0
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$0	$0	$0	$0	$0	$0
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$3,000	$3,000	$265,063	$265,063	$527,125	$527,125
1707030611	$600	$600	$53,013	$53,013	$105,425	$105,425
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$120	$120	$10,603	$10,603	$21,085	$21,085
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$240	$240	$21,205	$21,205	$42,170	$42,170

Appendix F.4
Annual Federal Lands Management Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$0	$0	$0	$0	$0	$0
1711000202	$0	$0	$0	$0	$0	$0
1711000204	$0	$0	$0	$0	$0	$0
1711000401	$318,763	$318,763	$610,100	$610,100	$901,436	$901,436
1711000402	$89,568	$89,568	$171,429	$171,429	$253,291	$253,291
1711000403	$77,254	$77,254	$147,861	$147,861	$218,467	$218,467
1711000404	$0	$0	$0	$0	$0	$0
1711000405	$0	$0	$0	$0	$0	$0
1711000504	$374	$374	$724	$724	$1,074	$1,074
1711000505	$93,777	$93,777	$179,485	$179,485	$265,193	$265,193
1711000506	$230,529	$230,529	$441,224	$441,224	$651,919	$651,919
1711000507	$153,272	$153,272	$293,356	$293,356	$433,441	$433,441
1711000508	$309,703	$309,703	$592,759	$592,759	$875,815	$875,815
1711000601	$464,700	$464,700	$889,417	$889,417	$1,314,135	$1,314,135
1711000602	$363,606	$363,606	$695,927	$695,927	$1,028,248	$1,028,248
1711000603	$274,201	$274,201	$524,834	$524,834	$775,467	$775,467
1711000604	$175,900	$175,900	$336,711	$336,711	$497,523	$497,523
1711000701	$111,977	$111,977	$214,320	$214,320	$316,662	$316,662
1711000702	$0	$0	$0	$0	$0	$0
1711000801	$273,768	$273,768	$523,982	$523,982	$774,195	$774,195
1711000802	$255,455	$255,455	$488,931	$488,931	$722,408	$722,408
1711000803	$0	$0	$0	$0	$0	$0
1711000901	$426,505	$426,505	$816,313	$816,313	$1,206,122	$1,206,122
1711000902	$455,119	$455,119	$871,080	$871,080	$1,287,041	$1,287,041
1711000903	$42,699	$42,699	$81,725	$81,725	$120,751	$120,751
1711000904	$50,585	$50,585	$96,817	$96,817	$143,049	$143,049
1711000905	$1,371	$1,371	$2,623	$2,623	$3,876	$3,876
1711001003	$253,458	$253,458	$485,110	$485,110	$716,761	$716,761
1711001004	$25,038	$25,038	$47,939	$47,939	$70,840	$70,840
1711001101	$591	$591	$1,131	$1,131	$1,671	$1,671
1711001102	$0	$0	$0	$0	$0	$0
1711001201	$51,281	$51,281	$98,150	$98,150	$145,019	$145,019
1711001202	$0	$0	$0	$0	$0	$0
1711001203	$0	$0	$0	$0	$0	$0
1711001204	$0	$0	$0	$0	$0	$0
1711001301	$101,895	$101,895	$195,024	$195,024	$288,153	$288,153

Puget Sound chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$9,605	$9,605	$18,384	$18,384	$27,163	$27,163
1711001303	$0	$0	$0	$0	$0	$0
1711001401	$282,223	$282,223	$540,164	$540,164	$798,105	$798,105
1711001402	$43,704	$43,704	$83,647	$83,647	$123,590	$123,590
1711001403	$59,794	$59,794	$114,444	$114,444	$169,094	$169,094
1711001404	$17,451	$17,451	$33,400	$33,400	$49,349	$49,349
1711001405	$0	$0	$0	$0	$0	$0
1711001502	$0	$0	$0	$0	$0	$0
1711001503	$0	$0	$0	$0	$0	$0
1711001601	$1,768	$1,768	$3,384	$3,384	$5,000	$5,000
1711001602	$0	$0	$0	$0	$0	$0
1711001701	$227,307	$227,307	$435,056	$435,056	$642,806	$642,806
1711001802	$30,374	$30,374	$58,134	$58,134	$85,895	$85,895
1711001803	$126,704	$126,704	$242,506	$242,506	$358,308	$358,308
1711001804	$47,936	$47,936	$91,747	$91,747	$135,559	$135,559
1711001805	$66,301	$66,301	$126,897	$126,897	$187,493	$187,493
1711001806	$118,703	$118,703	$227,193	$227,193	$335,682	$335,682
1711001808	$0	$0	$0	$0	$0	$0
1711001900	$0	$0	$0	$0	$0	$0
1711001901	$0	$0	$0	$0	$0	$0
1711001902	$0	$0	$0	$0	$0	$0
1711001904	$0	$0	$0	$0	$0	$0
1711002003	$170,851	$170,851	$327,003	$327,003	$483,154	$483,154
1711002004	$7,975	$7,975	$15,263	$15,263	$22,552	$22,552
1711002007	$24,458	$24,458	$46,812	$46,812	$69,166	$69,166
N01	$0	$0	$0	$0	$0	$0
N02	$0	$0	$0	$0	$0	$0
N03	$0	$0	$0	$0	$0	$0
N04	$0	$0	$0	$0	$0	$0
N05	$0	$0	$0	$0	$0	$0
N06	$0	$0	$0	$0	$0	$0
N07	$0	$0	$0	$0	$0	$0
N08	$0	$0	$0	$0	$0	$0
N09	$0	$0	$0	$0	$0	$0
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$0	$0	$0	$0	$0	$0
N13	$0	$0	$0	$0	$0	$0
N14	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$218,460	$218,460	$418,124	$418,124	$617,788	$617,788
1707010507	$135,815	$135,815	$259,945	$259,945	$384,074	$384,074
1707010508	$18,843	$18,843	$36,065	$36,065	$53,287	$53,287
1707010509	$369,497	$369,497	$707,219	$707,219	$1,044,940	$1,044,940
1707010510	$211,296	$211,296	$404,413	$404,413	$597,529	$597,529
1707010511	$394,678	$394,678	$755,398	$755,398	$1,116,118	$1,116,118
1707010512	$73,316	$73,316	$140,324	$140,324	$207,332	$207,332
1707010513	$141,887	$141,887	$271,578	$271,578	$401,269	$401,269
1708000101	$211,705	$211,705	$405,195	$405,195	$598,684	$598,684
1708000102	$112,640	$112,640	$215,588	$215,588	$318,537	$318,537
1708000103	$94,719	$94,719	$181,289	$181,289	$267,859	$267,859
1708000104	$34,124	$34,124	$65,311	$65,311	$96,499	$96,499
1708000105	$240,819	$240,819	$460,918	$460,918	$681,017	$681,017
1708000106	$22,736	$22,736	$43,516	$43,516	$64,296	$64,296
1708000107	$123,647	$123,647	$236,655	$236,655	$349,663	$349,663
1708000108	$23,064	$23,064	$44,143	$44,143	$65,223	$65,223
1708000109	$0	$0	$0	$0	$0	$0
1708000205	$91,802	$91,802	$175,706	$175,706	$259,609	$259,609
1708000206	$75,854	$75,854	$145,188	$145,188	$214,522	$214,522
1708000301	$37,345	$37,345	$71,476	$71,476	$105,608	$105,608
1708000302	$0	$0	$0	$0	$0	$0
1708000303	$2,165	$2,165	$4,144	$4,144	$6,123	$6,123
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$0	$0	$0	$0	$0	$0
1708000401	$218,524	$218,524	$418,247	$418,247	$617,970	$617,970
1708000402	$295,692	$295,692	$565,959	$565,959	$836,226	$836,226
1708000403	$253,148	$253,148	$484,555	$484,555	$715,963	$715,963
1708000404	$477,910	$477,910	$914,701	$914,701	$1,351,493	$1,351,493
1708000405	$347,872	$347,872	$665,814	$665,814	$983,756	$983,756

Lower Columbia River chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$56,230	$56,230	$107,621	$107,621	$159,013	$159,013
1708000502	$27,899	$27,899	$53,406	$53,406	$78,913	$78,913
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$135,115	$135,115	$258,605	$258,605	$382,095	$382,095
1708000505	$59,412	$59,412	$113,712	$113,712	$168,012	$168,012
1708000506	$26,412	$26,412	$50,552	$50,552	$74,692	$74,692
1708000507	$187	$187	$382	$382	$576	$576
1708000508	$0	$0	$0	$0	$0	$0
1708000601	$0	$0	$0	$0	$0	$0
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0
1709000704	$863	$863	$1,651	$1,651	$2,440	$2,440
1709001105	$65,746	$65,746	$125,836	$125,836	$185,925	$185,925
1709001106	$20,685	$20,685	$39,591	$39,591	$58,497	$58,497
1709001201	$0	$0	$0	$0	$0	$0
1709001202	$19,847	$19,847	$37,985	$37,985	$56,124	$56,124
1709001203	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$314,524	$314,524	$601,988	$601,988	$889,452	$889,452
1709000102	$111,942	$111,942	$214,253	$214,253	$316,564	$316,564
1709000103	$221,777	$221,777	$424,612	$424,612	$627,446	$627,446
1709000104	$247,850	$247,850	$474,376	$474,376	$700,902	$700,902
1709000105	$272,672	$272,672	$521,883	$521,883	$771,095	$771,095
1709000106	$457,860	$457,860	$876,413	$876,413	$1,294,967	$1,294,967
1709000107	$179,302	$179,302	$343,176	$343,176	$507,051	$507,051
1709000108	$26,394	$26,394	$50,516	$50,516	$74,639	$74,639
1709000109	$304,925	$304,925	$583,615	$583,615	$862,305	$862,305
1709000110	$14,484	$14,484	$27,722	$27,722	$40,960	$40,960
1709000201	$330,629	$330,629	$632,810	$632,810	$934,992	$934,992
1709000202	$51,901	$51,901	$99,336	$99,336	$146,771	$146,771
1709000203	$76,882	$76,882	$147,149	$147,149	$217,416	$217,416
1709000205	$16,257	$16,257	$31,116	$31,116	$45,974	$45,974
1709000301	$63,619	$63,619	$121,765	$121,765	$179,911	$179,911
1709000302	$8,430	$8,430	$16,135	$16,135	$23,839	$23,839
1709000303	$45,050	$45,050	$86,223	$86,223	$127,397	$127,397

Upper Willamette River chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$0	$0	$0	$0	$0	$0
1709000305	$47,105	$47,105	$90,158	$90,158	$133,211	$133,211
1709000306	$28,206	$28,206	$53,984	$53,984	$79,763	$79,763
1709000401	$686,610	$686,610	$1,314,149	$1,314,149	$1,941,688	$1,941,688
1709000402	$308,513	$308,513	$590,482	$590,482	$872,451	$872,451
1709000403	$397,023	$397,023	$759,967	$759,967	$1,122,911	$1,122,911
1709000404	$161,687	$161,687	$309,462	$309,462	$457,238	$457,238
1709000405	$67,259	$67,259	$128,730	$128,730	$190,202	$190,202
1709000406	$83,117	$83,117	$159,082	$159,082	$235,047	$235,047
1709000407	$100,225	$100,225	$191,826	$191,826	$283,427	$283,427
1709000504	$20,758	$20,758	$39,730	$39,730	$58,702	$58,702
1709000505	$151,918	$151,918	$290,765	$290,765	$429,613	$429,613
1709000506	$3,103	$3,103	$5,940	$5,940	$8,776	$8,776
1709000601	$14,862	$14,862	$28,444	$28,444	$42,027	$42,027
1709000602	$54,253	$54,253	$103,839	$103,839	$153,424	$153,424
1709000603	$40,994	$40,994	$78,461	$78,461	$115,928	$115,928
1709000606	$209,469	$209,469	$400,916	$400,916	$592,363	$592,363
1709000607	$1,389	$1,389	$2,659	$2,659	$3,928	$3,928
1709000608	$9,486	$9,486	$18,155	$18,155	$26,825	$26,825
1709000701	$1,124	$1,124	$2,150	$2,150	$3,177	$3,177
1709000702	$13,376	$13,376	$25,602	$25,602	$37,827	$37,827
1709000703	$43	$43	$82	$82	$121	$121
1709000704	$863	$863	$1,651	$1,651	$2,440	$2,440
1709000804	$4,599	$4,599	$8,802	$8,802	$13,005	$13,005
1709000805	$327	$327	$626	$626	$925	$925
1709000806	$38,475	$38,475	$73,640	$73,640	$108,805	$108,805
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$6,691	$6,691	$12,806	$12,806	$18,922	$18,922
1709000902	$11,765	$11,765	$22,518	$22,518	$33,270	$33,270
1709000903	$4,342	$4,342	$8,309	$8,309	$12,277	$12,277
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$115,310	$115,310	$220,699	$220,699	$326,087	$326,087
1709000906	$11,534	$11,534	$22,076	$22,076	$32,618	$32,618
1709001101	$300,149	$300,149	$574,473	$574,473	$848,797	$848,797
1709001102	$291,215	$291,215	$557,374	$557,374	$823,533	$823,533
1709001103	$239,793	$239,793	$458,954	$458,954	$678,115	$678,115
1709001104	$399,794	$399,794	$765,190	$765,190	$1,130,586	$1,130,586
1709001105	$65,746	$65,746	$125,836	$125,836	$185,925	$185,925
1709001106	$20,685	$20,685	$39,591	$39,591	$58,497	$58,497
1709001201	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$0	$0	$0	$0	$0	$0

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$58,146	$58,146	$114,540	$114,540	$170,934	$170,934
1702000801	$173,778	$173,778	$353,992	$353,992	$534,205	$534,205
1702000802	$191,710	$191,710	$390,520	$390,520	$589,330	$589,330
1702000803	$232,157	$232,157	$472,912	$472,912	$713,667	$713,667
1702000804	$277,545	$277,545	$565,370	$565,370	$853,195	$853,195
1702000805	$236,109	$236,109	$480,949	$480,949	$725,789	$725,789
1702000806	$269,005	$269,005	$547,973	$547,973	$826,940	$826,940
1702000807	$221,573	$221,573	$449,734	$449,734	$677,896	$677,896
1702001001	$697,122	$697,122	$1,334,903	$1,334,903	$1,972,683	$1,972,683
1702001002	$137,338	$137,338	$265,818	$265,818	$394,298	$394,298
1702001003	$11,925	$11,925	$24,292	$24,292	$36,658	$36,658
1702001004	$17,392	$17,392	$35,428	$35,428	$53,464	$53,464
1702001101	$515,428	$515,428	$986,510	$986,510	$1,457,591	$1,457,591
1702001102	$358,607	$358,607	$686,361	$686,361	$1,014,114	$1,014,114
1702001103	$369,699	$369,699	$707,589	$707,589	$1,045,480	$1,045,480
1702001104	$516,705	$516,705	$988,953	$988,953	$1,461,200	$1,461,200
1702001105	$340,068	$340,068	$651,496	$651,496	$962,923	$962,923
1702001604	$26,787	$26,787	$54,567	$54,567	$82,346	$82,346
1702001605	$2,833	$2,833	$5,771	$5,771	$8,708	$8,708
1702001606	$222	$222	$451	$451	$681	$681
1707010101	$188	$188	$383	$383	$578	$578
1707010102	$6,131	$6,131	$12,490	$12,490	$18,848	$18,848
1707010106	$1,128	$1,128	$2,298	$2,298	$3,468	$3,468
1707010109	$1,335	$1,335	$2,719	$2,719	$4,103	$4,103
1707010114	$8,995	$8,995	$17,788	$17,788	$26,580	$26,580
1707010501	$3,155	$3,155	$6,047	$6,047	$8,938	$8,938
1707010504	$52,866	$52,866	$101,184	$101,184	$149,503	$149,503
1707010512	$73,316	$73,316	$140,324	$140,324	$207,332	$207,332
1707010513	$141,887	$141,887	$271,578	$271,578	$401,269	$401,269
1708000107	$123,647	$123,647	$236,655	$236,655	$349,663	$349,663

Oregon Coast coho salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$0	$0	$0	$0	$0	$0
1710020201	$14,081	$14,081	$26,950	$26,950	$39,819	$39,819
1710020202	$0	$0	$0	$0	$0	$0
1710020203	$261	$261	$500	$500	$738	$738
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$0	$0	$0	$0
1710020206	$49	$49	$93	$93	$138	$138
1710020301	$59,882	$59,882	$114,613	$114,613	$169,343	$169,343
1710020302	$327,289	$327,289	$626,418	$626,418	$925,548	$925,548
1710020303	$3,645	$3,645	$6,977	$6,977	$10,309	$10,309
1710020304	$27,830	$27,830	$53,266	$53,266	$78,702	$78,702
1710020305	$10,599	$10,599	$20,286	$20,286	$29,973	$29,973
1710020306	$9,055	$9,055	$17,331	$17,331	$25,608	$25,608
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$0	$0	$0	$0	$0	$0
1710020309	$48,562	$48,562	$92,946	$92,946	$137,330	$137,330
1710020401	$1,290	$1,290	$2,469	$2,469	$3,649	$3,649
1710020402	$58,077	$58,077	$111,157	$111,157	$164,236	$164,236
1710020403	$11,236	$11,236	$21,505	$21,505	$31,774	$31,774
1710020405	$45	$45	$86	$86	$127	$127
1710020406	$4,534	$4,534	$8,678	$8,678	$12,822	$12,822
1710020407	$79,187	$79,187	$151,562	$151,562	$223,936	$223,936
1710020408	$37,342	$37,342	$71,472	$71,472	$105,601	$105,601
1710020409	$6,216	$6,216	$11,898	$11,898	$17,579	$17,579
1710020501	$135,757	$135,757	$259,833	$259,833	$383,909	$383,909
1710020502	$189,973	$189,973	$363,601	$363,601	$537,228	$537,228
1710020503	$91,393	$91,393	$174,923	$174,923	$258,452	$258,452
1710020504	$168,749	$168,749	$322,979	$322,979	$477,209	$477,209
1710020505	$32,547	$32,547	$62,293	$62,293	$92,040	$92,040
1710020506	$62,607	$62,607	$119,827	$119,827	$177,048	$177,048
1710020507	$166,296	$166,296	$318,283	$318,283	$470,271	$470,271
1710020508	$22,186	$22,186	$42,462	$42,462	$62,739	$62,739
1710020601	$173,556	$173,556	$332,178	$332,178	$490,801	$490,801
1710020602	$51,481	$51,481	$98,533	$98,533	$145,584	$145,584
1710020603	$43,393	$43,393	$83,053	$83,053	$122,713	$122,713
1710020604	$105,819	$105,819	$202,534	$202,534	$299,248	$299,248
1710020605	$93,755	$93,755	$179,444	$179,444	$265,133	$265,133
1710020606	$78,331	$78,331	$149,923	$149,923	$221,515	$221,515
1710020607	$98,341	$98,341	$188,221	$188,221	$278,101	$278,101
1710020608	$150,681	$150,681	$288,398	$288,398	$426,115	$426,115

Oregon Coast coho salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$105,839	$105,839	$202,571	$202,571	$299,303	$299,303
1710030106	$60,097	$60,097	$115,024	$115,024	$169,951	$169,951
1710030107	$348,271	$348,271	$666,576	$666,576	$984,882	$984,882
1710030108	$317,333	$317,333	$607,364	$607,364	$897,394	$897,394
1710030109	$95,677	$95,677	$183,123	$183,123	$270,568	$270,568
1710030110	$87,574	$87,574	$167,613	$167,613	$247,652	$247,652
1710030111	$255,013	$255,013	$488,086	$488,086	$721,158	$721,158
1710030112	$18,081	$18,081	$34,607	$34,607	$51,132	$51,132
1710030201	$267,926	$267,926	$512,800	$512,800	$757,675	$757,675
1710030202	$296,315	$296,315	$567,135	$567,135	$837,955	$837,955
1710030203	$266,617	$266,617	$510,294	$510,294	$753,971	$753,971
1710030204	$103,680	$103,680	$198,439	$198,439	$293,199	$293,199
1710030205	$186,071	$186,071	$356,133	$356,133	$526,195	$526,195
1710030207	$140,636	$140,636	$269,171	$269,171	$397,707	$397,707
1710030208	$92,243	$92,243	$176,550	$176,550	$260,857	$260,857
1710030209	$123,802	$123,802	$236,952	$236,952	$350,101	$350,101
1710030210	$23,476	$23,476	$44,932	$44,932	$66,388	$66,388
1710030211	$96,057	$96,057	$183,849	$183,849	$271,642	$271,642
1710030212	$83,831	$83,831	$160,450	$160,450	$237,068	$237,068
1710030213	$12,676	$12,676	$24,261	$24,261	$35,847	$35,847
1710030301	$181,430	$181,430	$347,249	$347,249	$513,069	$513,069
1710030302	$37,573	$37,573	$71,913	$71,913	$106,253	$106,253
1710030303	$140,209	$140,209	$268,354	$268,354	$396,499	$396,499
1710030304	$70,627	$70,627	$135,178	$135,178	$199,729	$199,729
1710030305	$76,945	$76,945	$147,269	$147,269	$217,594	$217,594
1710030306	$174,786	$174,786	$334,534	$334,534	$494,282	$494,282
1710030307	$250,595	$250,595	$479,629	$479,629	$708,662	$708,662
1710030308	$47,549	$47,549	$91,006	$91,006	$134,463	$134,463
1710030401	$87,989	$87,989	$168,408	$168,408	$248,827	$248,827
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$26,334	$26,334	$50,402	$50,402	$74,471	$74,471
1710030404	$36,890	$36,890	$70,607	$70,607	$104,323	$104,323
1710030501	$206,700	$206,700	$395,615	$395,615	$584,531	$584,531
1710030502	$198,942	$198,942	$380,768	$380,768	$562,593	$562,593
1710030503	$17,174	$17,174	$32,870	$32,870	$48,566	$48,566
1710030504	$144,751	$144,751	$277,048	$277,048	$409,346	$409,346
1710030505	$112,226	$112,226	$214,796	$214,796	$317,366	$317,366
1710030506	$8,357	$8,357	$15,994	$15,994	$23,632	$23,632
1710030603	$74,716	$74,716	$143,003	$143,003	$211,290	$211,290
1710030604	$11,779	$11,779	$22,544	$22,544	$33,310	$33,310

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$227,307	$227,307	$435,056	$435,056	$642,806	$642,806
1711001802	$30,374	$30,374	$58,134	$58,134	$85,895	$85,895
1711001803	$126,704	$126,704	$242,506	$242,506	$358,308	$358,308
1711001804	$47,936	$47,936	$91,747	$91,747	$135,559	$135,559
1711001805	$66,301	$66,301	$126,897	$126,897	$187,493	$187,493
1711001806	$118,703	$118,703	$227,193	$227,193	$335,682	$335,682
1711001807	$44,939	$44,939	$86,011	$86,011	$127,083	$127,083
1711001808	$0	$0	$0	$0	$0	$0
1711001908	$0	$0	$0	$0	$0	$0
1711002001	$23,049	$23,049	$44,115	$44,115	$65,181	$65,181
1711002002	$27,972	$27,972	$53,536	$53,536	$79,101	$79,101
1711002003	$170,851	$170,851	$327,003	$327,003	$483,154	$483,154
N15	$0	$0	$0	$0	$0	$0
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$369,497	$369,497	$707,219	$707,219	$1,044,940	$1,044,940
1707010512	$73,316	$73,316	$140,324	$140,324	$207,332	$207,332
1707010513	$141,887	$141,887	$271,578	$271,578	$401,269	$401,269
1708000106	$22,736	$22,736	$43,516	$43,516	$64,296	$64,296
1708000107	$123,647	$123,647	$236,655	$236,655	$349,663	$349,663
1708000109	$0	$0	$0	$0	$0	$0
1708000205	$91,802	$91,802	$175,706	$175,706	$259,609	$259,609
1708000206	$75,854	$75,854	$145,188	$145,188	$214,522	$214,522
1708000301	$37,345	$37,345	$71,476	$71,476	$105,608	$105,608
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$135,115	$135,115	$258,605	$258,605	$382,095	$382,095
1708000505	$59,412	$59,412	$113,712	$113,712	$168,012	$168,012
1708000506	$26,412	$26,412	$50,552	$50,552	$74,692	$74,692
1708000507	$187	$187	$382	$382	$576	$576
1708000508	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0

Ozette Lake sockeye salmon ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$3,335	$3,335	$6,793	$6,793	$10,251	$10,251
1702000504	$1,958	$1,958	$3,989	$3,989	$6,019	$6,019
1702000505	$58,146	$58,146	$114,540	$114,540	$170,934	$170,934
1702000601	$56,867	$56,867	$115,840	$115,840	$174,813	$174,813
1702000602	$80,303	$80,303	$163,580	$163,580	$246,858	$246,858
1702000603	$105,467	$105,467	$214,840	$214,840	$324,213	$324,213
1702000604	$8,061	$8,061	$16,420	$16,420	$24,779	$24,779
1702000605	$10,573	$10,573	$21,537	$21,537	$32,501	$32,501
1702000704	$27,753	$27,753	$56,534	$56,534	$85,315	$85,315
1702000801	$173,778	$173,778	$353,992	$353,992	$534,205	$534,205
1702000802	$191,710	$191,710	$390,520	$390,520	$589,330	$589,330
1702000803	$232,157	$232,157	$472,912	$472,912	$713,667	$713,667
1702000804	$277,545	$277,545	$565,370	$565,370	$853,195	$853,195
1702000805	$236,109	$236,109	$480,949	$480,949	$725,789	$725,789
1702000806	$269,005	$269,005	$547,973	$547,973	$826,940	$826,940
1702000807	$221,573	$221,573	$449,734	$449,734	$677,896	$677,896
1702000903	$317,338	$317,338	$608,004	$608,004	$898,671	$898,671
1702001001	$697,122	$697,122	$1,334,903	$1,334,903	$1,972,683	$1,972,683
1702001002	$137,338	$137,338	$265,818	$265,818	$394,298	$394,298
1702001003	$11,925	$11,925	$24,292	$24,292	$36,658	$36,658
1702001004	$17,392	$17,392	$35,428	$35,428	$53,464	$53,464
1702001101	$515,428	$515,428	$986,510	$986,510	$1,457,591	$1,457,591
1702001102	$358,607	$358,607	$686,361	$686,361	$1,014,114	$1,014,114
1702001103	$369,699	$369,699	$707,589	$707,589	$1,045,480	$1,045,480
1702001104	$516,705	$516,705	$988,953	$988,953	$1,461,200	$1,461,200

Upper Columbia River O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$340,068	$340,068	$651,496	$651,496	$962,923	$962,923
1702001204	$19,643	$19,643	$40,013	$40,013	$60,384	$60,384
1702001509	$14,942	$14,942	$30,438	$30,438	$45,933	$45,933
1702001604	$26,787	$26,787	$54,567	$54,567	$82,346	$82,346
1702001605	$2,833	$2,833	$5,771	$5,771	$8,708	$8,708
1702001606	$222	$222	$451	$451	$681	$681
1707010101	$188	$188	$383	$383	$578	$578
1707010102	$6,131	$6,131	$12,490	$12,490	$18,848	$18,848
1707010106	$1,128	$1,128	$2,298	$2,298	$3,468	$3,468
1707010109	$1,335	$1,335	$2,719	$2,719	$4,103	$4,103
1707010114	$8,995	$8,995	$17,788	$17,788	$26,580	$26,580
1707010501	$3,155	$3,155	$6,047	$6,047	$8,938	$8,938
1707010504	$52,866	$52,866	$101,184	$101,184	$149,503	$149,503
1707010512	$73,316	$73,316	$140,324	$140,324	$207,332	$207,332
1707010513	$141,887	$141,887	$271,578	$271,578	$401,269	$401,269
1708000107	$123,647	$123,647	$236,655	$236,655	$349,663	$349,663

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$222	$222	$451	$451	$681	$681
1706010101	$193,040	$193,040	$391,997	$391,997	$590,953	$590,953
1706010102	$147,300	$147,300	$299,745	$299,745	$452,191	$452,191
1706010104	$58,317	$58,317	$118,115	$118,115	$177,913	$177,913
1706010201	$146,447	$146,447	$298,318	$298,318	$450,190	$450,190
1706010202	$120,063	$120,063	$244,573	$244,573	$369,083	$369,083
1706010203	$116,353	$116,353	$237,016	$237,016	$357,679	$357,679
1706010204	$49,694	$49,694	$101,229	$101,229	$152,763	$152,763
1706010205	$194,732	$194,732	$396,676	$396,676	$598,620	$598,620
1706010301	$70,534	$70,534	$142,954	$142,954	$215,374	$215,374
1706010302	$195,123	$195,123	$373,533	$373,533	$551,944	$551,944
1706010303	$3,659	$3,659	$7,061	$7,061	$10,463	$10,463
1706010401	$191,802	$191,802	$390,138	$390,138	$588,474	$588,474
1706010402	$138,938	$138,938	$282,417	$282,417	$425,896	$425,896
1706010403	$103,891	$103,891	$211,628	$211,628	$319,366	$319,366
1706010404	$61,519	$61,519	$125,314	$125,314	$189,110	$189,110
1706010405	$79,644	$79,644	$162,238	$162,238	$244,832	$244,832
1706010406	$11,143	$11,143	$22,699	$22,699	$34,255	$34,255

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$15,230	$15,230	$31,024	$31,024	$46,819	$46,819
1706010408	$36,480	$36,480	$70,447	$70,447	$104,414	$104,414
1706010409	$41,850	$41,850	$85,249	$85,249	$128,649	$128,649
1706010410	$145,474	$145,474	$278,432	$278,432	$411,390	$411,390
1706010411	$76,417	$76,417	$146,260	$146,260	$216,102	$216,102
1706010501	$91,234	$91,234	$185,846	$185,846	$280,459	$280,459
1706010502	$70,976	$70,976	$144,581	$144,581	$218,186	$218,186
1706010503	$1,389	$1,389	$2,828	$2,828	$4,268	$4,268
1706010504	$59,629	$59,629	$121,467	$121,467	$183,305	$183,305
1706010505	$222,231	$222,231	$452,694	$452,694	$683,156	$683,156
1706010506	$15,910	$15,910	$32,409	$32,409	$48,909	$48,909
1706010601	$149,881	$149,881	$288,758	$288,758	$427,635	$427,635
1706010602	$94,278	$94,278	$192,047	$192,047	$289,816	$289,816
1706010603	$563,086	$563,086	$1,077,817	$1,077,817	$1,592,548	$1,592,548
1706010604	$103,521	$103,521	$210,877	$210,877	$318,233	$318,233
1706010605	$90,886	$90,886	$185,138	$185,138	$279,390	$279,390
1706010606	$95,580	$95,580	$194,700	$194,700	$293,820	$293,820
1706010607	$88,432	$88,432	$170,426	$170,426	$252,421	$252,421
1706010701	$406	$406	$827	$827	$1,247	$1,247
1706010702	$369	$369	$751	$751	$1,133	$1,133
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$67	$67	$137	$137	$207	$207
1706010705	$27,345	$27,345	$52,337	$52,337	$77,328	$77,328
1706010706	$210,669	$210,669	$403,213	$403,213	$595,756	$595,756
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$336	$336	$684	$684	$1,032	$1,032
1706010808	$1,323	$1,323	$2,696	$2,696	$4,068	$4,068
1706011001	$1,089	$1,089	$2,218	$2,218	$3,347	$3,347
1706011003	$975	$975	$1,986	$1,986	$2,997	$2,997
1706011004	$33,128	$33,128	$67,483	$67,483	$101,839	$101,839
1706020101	$40,802	$40,802	$75,604	$75,604	$110,406	$110,406
1706020104	$47,686	$47,686	$88,359	$88,359	$129,033	$129,033
1706020105	$33,563	$33,563	$62,190	$62,190	$90,818	$90,818
1706020107	$34,439	$34,439	$63,814	$63,814	$93,188	$93,188
1706020108	$48,843	$48,843	$90,503	$90,503	$132,163	$132,163
1706020109	$31,880	$31,880	$59,072	$59,072	$86,263	$86,263
1706020110	$42,483	$42,483	$78,718	$78,718	$114,954	$114,954
1706020111	$21,823	$21,823	$40,437	$40,437	$59,051	$59,051
1706020112	$20,900	$20,900	$38,726	$38,726	$56,552	$56,552
1706020113	$51,422	$51,422	$95,283	$95,283	$139,143	$139,143

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$35,156	$35,156	$65,143	$65,143	$95,129	$95,129
1706020115	$34,112	$34,112	$63,207	$63,207	$92,303	$92,303
1706020117	$27,436	$27,436	$50,837	$50,837	$74,238	$74,238
1706020118	$21,814	$21,814	$40,420	$40,420	$59,026	$59,026
1706020119	$40,336	$40,336	$74,741	$74,741	$109,146	$109,146
1706020120	$28,780	$28,780	$53,328	$53,328	$77,875	$77,875
1706020121	$18,015	$18,015	$33,382	$33,382	$48,748	$48,748
1706020122	$22,268	$22,268	$41,261	$41,261	$60,254	$60,254
1706020123	$36,456	$36,456	$67,551	$67,551	$98,646	$98,646
1706020124	$22,602	$22,602	$41,880	$41,880	$61,158	$61,158
1706020125	$38,486	$38,486	$71,312	$71,312	$104,138	$104,138
1706020126	$24,744	$24,744	$45,849	$45,849	$66,955	$66,955
1706020127	$18,822	$18,822	$34,877	$34,877	$50,931	$50,931
1706020128	$32,336	$32,336	$59,917	$59,917	$87,498	$87,498
1706020129	$12,381	$12,381	$22,942	$22,942	$33,502	$33,502
1706020130	$27,891	$27,891	$51,680	$51,680	$75,470	$75,470
1706020132	$45,292	$45,292	$83,923	$83,923	$122,554	$122,554
1706020201	$47,276	$47,276	$87,599	$87,599	$127,923	$127,923
1706020202	$69,062	$69,062	$127,969	$127,969	$186,875	$186,875
1706020203	$21,408	$21,408	$39,668	$39,668	$57,929	$57,929
1706020301	$21,967	$21,967	$40,703	$40,703	$59,440	$59,440
1706020302	$22,132	$22,132	$41,009	$41,009	$59,887	$59,887
1706020303	$56,184	$56,184	$104,105	$104,105	$152,026	$152,026
1706020304	$22,869	$22,869	$42,375	$42,375	$61,881	$61,881
1706020305	$61,365	$61,365	$113,706	$113,706	$166,048	$166,048
1706020306	$88,135	$88,135	$163,310	$163,310	$238,484	$238,484
1706020307	$20,745	$20,745	$38,440	$38,440	$56,134	$56,134
1706020308	$19,256	$19,256	$35,680	$35,680	$52,104	$52,104
1706020309	$23,496	$23,496	$43,537	$43,537	$63,577	$63,577
1706020310	$31,964	$31,964	$59,227	$59,227	$86,490	$86,490
1706020311	$35,221	$35,221	$65,263	$65,263	$95,304	$95,304
1706020312	$58,084	$58,084	$107,626	$107,626	$157,169	$157,169
1706020313	$31,409	$31,409	$58,198	$58,198	$84,988	$84,988
1706020314	$23,490	$23,490	$43,526	$43,526	$63,562	$63,562
1706020315	$27,390	$27,390	$50,751	$50,751	$74,113	$74,113
1706020316	$17,732	$17,732	$32,856	$32,856	$47,980	$47,980
1706020317	$34,763	$34,763	$64,414	$64,414	$94,065	$94,065
1706020318	$16,306	$16,306	$30,214	$30,214	$44,123	$44,123
1706020319	$36,130	$36,130	$66,946	$66,946	$97,762	$97,762
1706020320	$18,836	$18,836	$34,901	$34,901	$50,967	$50,967

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$19,411	$19,411	$35,968	$35,968	$52,524	$52,524
1706020322	$35,879	$35,879	$66,482	$66,482	$97,084	$97,084
1706020323	$20,940	$20,940	$38,800	$38,800	$56,661	$56,661
1706020401	$25,082	$25,082	$46,475	$46,475	$67,869	$67,869
1706020402	$31,880	$31,880	$59,072	$59,072	$86,264	$86,264
1706020403	$29,758	$29,758	$55,140	$55,140	$80,522	$80,522
1706020404	$16,914	$16,914	$31,340	$31,340	$45,766	$45,766
1706020405	$20,314	$20,314	$37,641	$37,641	$54,968	$54,968
1706020406	$24,861	$24,861	$46,066	$46,066	$67,271	$67,271
1706020407	$22,305	$22,305	$41,329	$41,329	$60,353	$60,353
1706020408	$34,603	$34,603	$64,117	$64,117	$93,631	$93,631
1706020409	$25,322	$25,322	$46,920	$46,920	$68,519	$68,519
1706020414	$55,944	$55,944	$103,662	$103,662	$151,379	$151,379
1706020501	$57,311	$57,311	$106,195	$106,195	$155,078	$155,078
1706020502	$41,432	$41,432	$76,771	$76,771	$112,110	$112,110
1706020503	$55,616	$55,616	$103,053	$103,053	$150,490	$150,490
1706020504	$18,798	$18,798	$34,831	$34,831	$50,864	$50,864
1706020505	$53,169	$53,169	$98,520	$98,520	$143,870	$143,870
1706020506	$65,389	$65,389	$121,161	$121,161	$176,934	$176,934
1706020507	$66,081	$66,081	$122,445	$122,445	$178,808	$178,808
1706020508	$83,018	$83,018	$153,828	$153,828	$224,638	$224,638
1706020509	$21,578	$21,578	$39,982	$39,982	$58,387	$58,387
1706020510	$49,835	$49,835	$92,341	$92,341	$134,847	$134,847
1706020511	$36,509	$36,509	$67,649	$67,649	$98,789	$98,789
1706020512	$50,720	$50,720	$93,982	$93,982	$137,244	$137,244
1706020513	$51,254	$51,254	$94,970	$94,970	$138,687	$138,687
1706020601	$66,858	$66,858	$123,884	$123,884	$180,911	$180,911
1706020602	$16,381	$16,381	$30,354	$30,354	$44,326	$44,326
1706020603	$37,677	$37,677	$69,813	$69,813	$101,949	$101,949
1706020604	$46,136	$46,136	$85,488	$85,488	$124,840	$124,840
1706020605	$22,467	$22,467	$41,630	$41,630	$60,793	$60,793
1706020606	$57,833	$57,833	$107,161	$107,161	$156,490	$156,490
1706020607	$16,598	$16,598	$30,755	$30,755	$44,911	$44,911
1706020608	$28,830	$28,830	$53,420	$53,420	$78,010	$78,010
1706020609	$44,057	$44,057	$81,636	$81,636	$119,214	$119,214
1706020610	$41,393	$41,393	$76,698	$76,698	$112,003	$112,003
1706020611	$53,778	$53,778	$99,647	$99,647	$145,516	$145,516
1706020612	$15,803	$15,803	$29,282	$29,282	$42,761	$42,761
1706020613	$31,192	$31,192	$57,796	$57,796	$84,401	$84,401
1706020614	$19,020	$19,020	$35,244	$35,244	$51,467	$51,467

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$14,513	$14,513	$26,891	$26,891	$39,269	$39,269
1706020616	$44,742	$44,742	$82,905	$82,905	$121,067	$121,067
1706020617	$35,339	$35,339	$65,481	$65,481	$95,623	$95,623
1706020701	$18,786	$18,786	$34,810	$34,810	$50,833	$50,833
1706020702	$27,235	$27,235	$50,466	$50,466	$73,696	$73,696
1706020703	$47,000	$47,000	$87,088	$87,088	$127,177	$127,177
1706020704	$22,389	$22,389	$41,485	$41,485	$60,581	$60,581
1706020705	$55,944	$55,944	$103,662	$103,662	$151,379	$151,379
1706020706	$21,459	$21,459	$39,762	$39,762	$58,066	$58,066
1706020707	$24,859	$24,859	$46,062	$46,062	$67,264	$67,264
1706020708	$89,370	$89,370	$165,598	$165,598	$241,825	$241,825
1706020709	$49,803	$49,803	$92,380	$92,380	$134,958	$134,958
1706020710	$24,427	$24,427	$45,261	$45,261	$66,095	$66,095
1706020711	$124,242	$124,242	$236,894	$236,894	$349,547	$349,547
1706020712	$75,851	$75,851	$144,386	$144,386	$212,921	$212,921
1706020713	$91,618	$91,618	$173,986	$173,986	$256,354	$256,354
1706020714	$62,775	$62,775	$116,411	$116,411	$170,047	$170,047
1706020715	$29,899	$29,899	$55,401	$55,401	$80,903	$80,903
1706020716	$26,214	$26,214	$48,574	$48,574	$70,933	$70,933
1706020717	$40,113	$40,113	$74,326	$74,326	$108,540	$108,540
1706020718	$61,021	$61,021	$113,069	$113,069	$165,116	$165,116
1706020719	$38,299	$38,299	$70,966	$70,966	$103,632	$103,632
1706020801	$63,037	$63,037	$116,804	$116,804	$170,571	$170,571
1706020802	$54,626	$54,626	$101,219	$101,219	$147,812	$147,812
1706020803	$32,243	$32,243	$59,744	$59,744	$87,244	$87,244
1706020804	$54,771	$54,771	$101,488	$101,488	$148,205	$148,205
1706020805	$30,949	$30,949	$57,347	$57,347	$83,745	$83,745
1706020806	$16,701	$16,701	$30,945	$30,945	$45,190	$45,190
1706020807	$44,407	$44,407	$82,284	$82,284	$120,161	$120,161
1706020808	$40,812	$40,812	$75,623	$75,623	$110,433	$110,433
1706020809	$30,620	$30,620	$56,737	$56,737	$82,854	$82,854
1706020810	$43,640	$43,640	$80,863	$80,863	$118,085	$118,085
1706020811	$21,075	$21,075	$39,051	$39,051	$57,027	$57,027
1706020812	$22,046	$22,046	$40,851	$40,851	$59,655	$59,655
1706020813	$49,090	$49,090	$90,960	$90,960	$132,831	$132,831
1706020814	$36,977	$36,977	$68,516	$68,516	$100,056	$100,056
1706020815	$19,539	$19,539	$36,204	$36,204	$52,870	$52,870
1706020901	$5,153	$5,153	$9,549	$9,549	$13,945	$13,945
1706020902	$1,416	$1,416	$2,624	$2,624	$3,832	$3,832
1706020903	$670	$670	$1,242	$1,242	$1,814	$1,814

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$3,068	$3,068	$5,685	$5,685	$8,302	$8,302
1706020905	$6,614	$6,614	$12,256	$12,256	$17,897	$17,897
1706020906	$95	$95	$176	$176	$258	$258
1706020907	$3,096	$3,096	$5,736	$5,736	$8,377	$8,377
1706020908	$24,871	$24,871	$46,084	$46,084	$67,297	$67,297
1706020909	$7,905	$7,905	$14,676	$14,676	$21,446	$21,446
1706020910	$9,628	$9,628	$17,840	$17,840	$26,053	$26,053
1706020911	$54,613	$54,613	$101,195	$101,195	$147,777	$147,777
1706020912	$35,359	$35,359	$65,576	$65,576	$95,793	$95,793
1706020913	$23,516	$23,516	$43,574	$43,574	$63,632	$63,632
1706020914	$14,148	$14,148	$26,216	$26,216	$38,283	$38,283
1706020915	$23,460	$23,460	$43,471	$43,471	$63,481	$63,481
1706020916	$28,643	$28,643	$53,073	$53,073	$77,504	$77,504
1706020917	$566	$566	$1,049	$1,049	$1,533	$1,533
1706021001	$22,684	$22,684	$42,034	$42,034	$61,383	$61,383
1706021002	$27,327	$27,327	$50,635	$50,635	$73,943	$73,943
1706021003	$17,849	$17,849	$33,073	$33,073	$48,298	$48,298
1706021006	$16,066	$16,066	$29,770	$29,770	$43,474	$43,474
1706021007	$63,298	$63,298	$121,250	$121,250	$179,202	$179,202
1706030101	$51,005	$51,005	$94,672	$94,672	$138,339	$138,339
1706030102	$80,534	$80,534	$149,440	$149,440	$218,346	$218,346
1706030103	$220,941	$220,941	$422,867	$422,867	$624,792	$624,792
1706030104	$257,816	$257,816	$493,440	$493,440	$729,064	$729,064
1706030105	$97,335	$97,335	$186,295	$186,295	$275,255	$275,255
1706030106	$404,813	$404,813	$774,776	$774,776	$1,144,738	$1,144,738
1706030107	$139,216	$139,216	$266,449	$266,449	$393,683	$393,683
1706030108	$91,988	$91,988	$174,544	$174,544	$257,101	$257,101
1706030109	$13,645	$13,645	$25,361	$25,361	$37,076	$37,076
1706030201	$47,626	$47,626	$88,249	$88,249	$128,871	$128,871
1706030202	$20,682	$20,682	$38,322	$38,322	$55,962	$55,962
1706030203	$43,009	$43,009	$79,694	$79,694	$116,378	$116,378
1706030204	$11,744	$11,744	$21,762	$21,762	$31,779	$31,779
1706030205	$24,837	$24,837	$46,022	$46,022	$67,207	$67,207
1706030207	$44,140	$44,140	$81,788	$81,788	$119,437	$119,437
1706030208	$49,307	$49,307	$91,362	$91,362	$133,418	$133,418
1706030209	$49,746	$49,746	$92,176	$92,176	$134,606	$134,606
1706030210	$14,521	$14,521	$26,907	$26,907	$39,293	$39,293
1706030211	$25,074	$25,074	$46,461	$46,461	$67,847	$67,847
1706030212	$29,972	$29,972	$55,537	$55,537	$81,101	$81,101
1706030213	$50,369	$50,369	$93,330	$93,330	$136,292	$136,292

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$25,424	$25,424	$47,108	$47,108	$68,793	$68,793
1706030301	$81,659	$81,659	$151,310	$151,310	$220,960	$220,960
1706030302	$37,957	$37,957	$70,332	$70,332	$102,706	$102,706
1706030303	$56,360	$56,360	$104,432	$104,432	$152,505	$152,505
1706030304	$53,923	$53,923	$99,916	$99,916	$145,909	$145,909
1706030305	$3,358	$3,358	$6,222	$6,222	$9,086	$9,086
1706030306	$27,481	$27,481	$50,920	$50,920	$74,360	$74,360
1706030307	$19,605	$19,605	$36,326	$36,326	$53,048	$53,048
1706030308	$19,332	$19,332	$35,821	$35,821	$52,310	$52,310
1706030309	$21,494	$21,494	$39,826	$39,826	$58,159	$58,159
1706030310	$69,575	$69,575	$128,919	$128,919	$188,263	$188,263
1706030311	$30,973	$30,973	$57,392	$57,392	$83,810	$83,810
1706030312	$22,643	$22,643	$41,956	$41,956	$61,269	$61,269
1706030313	$20,924	$20,924	$38,770	$38,770	$56,617	$56,617
1706030314	$19,228	$19,228	$35,628	$35,628	$52,028	$52,028
1706030401	$18,125	$18,125	$33,585	$33,585	$49,044	$49,044
1706030402	$29,360	$29,360	$54,402	$54,402	$79,445	$79,445
1706030501	$26,256	$26,256	$48,651	$48,651	$71,045	$71,045
1706030502	$17,044	$17,044	$31,582	$31,582	$46,120	$46,120
1706030503	$33,826	$33,826	$62,678	$62,678	$91,530	$91,530
1706030504	$34,558	$34,558	$64,034	$64,034	$93,510	$93,510
1706030505	$28,394	$28,394	$52,613	$52,613	$76,831	$76,831
1706030506	$33,527	$33,527	$62,124	$62,124	$90,721	$90,721
1706030507	$68,016	$68,016	$126,030	$126,030	$184,043	$184,043
1706030508	$30,388	$30,388	$56,306	$56,306	$82,225	$82,225
1706030509	$23,480	$23,480	$43,508	$43,508	$63,535	$63,535
1706030510	$48,158	$48,158	$89,235	$89,235	$130,311	$130,311
1706030511	$16,202	$16,202	$30,021	$30,021	$43,840	$43,840
1706030512	$59	$59	$109	$109	$160	$160
1706030513	$319	$319	$591	$591	$862	$862
1706030601	$43	$43	$80	$80	$116	$116
1706030602	$427	$427	$791	$791	$1,156	$1,156
1706030603	$66	$66	$122	$122	$178	$178
1706030604	$52	$52	$97	$97	$142	$142
1706030606	$361	$361	$669	$669	$977	$977
1706030607	$32,266	$32,266	$59,786	$59,786	$87,307	$87,307
1706030608	$570	$570	$1,057	$1,057	$1,543	$1,543
1706030609	$189	$189	$351	$351	$513	$513
1706030610	$2,736	$2,736	$5,069	$5,069	$7,403	$7,403
1706030611	$898	$898	$1,664	$1,664	$2,431	$2,431

Snake River Basin O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$141	$141	$261	$261	$380	$380
1706030613	$8,066	$8,066	$14,946	$14,946	$21,826	$21,826
1706030614	$433	$433	$801	$801	$1,170	$1,170
1706030615	$3,636	$3,636	$6,738	$6,738	$9,839	$9,839
1706030616	$11,182	$11,182	$20,720	$20,720	$30,258	$30,258
1706030617	$9,751	$9,751	$18,067	$18,067	$26,384	$26,384
1706030618	$14,438	$14,438	$26,752	$26,752	$39,067	$39,067
1706030619	$19,146	$19,146	$35,476	$35,476	$51,807	$51,807
1706030620	$1,167	$1,167	$2,162	$2,162	$3,157	$3,157
1706030621	$1,536	$1,536	$2,846	$2,846	$4,157	$4,157
1706030622	$288	$288	$533	$533	$779	$779
1706030623	$554	$554	$1,027	$1,027	$1,499	$1,499
1706030624	$163	$163	$303	$303	$442	$442
1706030627	$25	$25	$46	$46	$68	$68
1706030630	$292	$292	$541	$541	$790	$790
1706030631	$12	$12	$22	$22	$32	$32
1706030801	$187	$187	$346	$346	$506	$506
1707010101	$188	$188	$383	$383	$578	$578
1707010102	$6,131	$6,131	$12,490	$12,490	$18,848	$18,848
1707010106	$1,128	$1,128	$2,298	$2,298	$3,468	$3,468
1707010109	$1,335	$1,335	$2,719	$2,719	$4,103	$4,103
1707010114	$8,995	$8,995	$17,788	$17,788	$26,580	$26,580
1707010501	$3,155	$3,155	$6,047	$6,047	$8,938	$8,938
1707010504	$52,866	$52,866	$101,184	$101,184	$149,503	$149,503
1707010512	$73,316	$73,316	$140,324	$140,324	$207,332	$207,332
1707010513	$141,887	$141,887	$271,578	$271,578	$401,269	$401,269
1708000107	$123,647	$123,647	$236,655	$236,655	$349,663	$349,663

Lower Columbia River O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$218,460	$218,460	$418,124	$418,124	$617,788	$617,788
1707010507	$135,815	$135,815	$259,945	$259,945	$384,074	$384,074
1707010508	$18,843	$18,843	$36,065	$36,065	$53,287	$53,287
1707010511	$394,678	$394,678	$755,398	$755,398	$1,116,118	$1,116,118
1707010512	$73,316	$73,316	$140,324	$140,324	$207,332	$207,332
1707010513	$141,887	$141,887	$271,578	$271,578	$401,269	$401,269
1708000101	$211,705	$211,705	$405,195	$405,195	$598,684	$598,684

Lower Columbia River O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$112,640	$112,640	$215,588	$215,588	$318,537	$318,537
1708000103	$94,719	$94,719	$181,289	$181,289	$267,859	$267,859
1708000104	$34,124	$34,124	$65,311	$65,311	$96,499	$96,499
1708000105	$240,819	$240,819	$460,918	$460,918	$681,017	$681,017
1708000106	$22,736	$22,736	$43,516	$43,516	$64,296	$64,296
1708000107	$123,647	$123,647	$236,655	$236,655	$349,663	$349,663
1708000108	$23,064	$23,064	$44,143	$44,143	$65,223	$65,223
1708000109	$0	$0	$0	$0	$0	$0
1708000205	$91,802	$91,802	$175,706	$175,706	$259,609	$259,609
1708000206	$75,854	$75,854	$145,188	$145,188	$214,522	$214,522
1708000301	$37,345	$37,345	$71,476	$71,476	$105,608	$105,608
1708000401	$218,524	$218,524	$418,247	$418,247	$617,970	$617,970
1708000402	$295,692	$295,692	$565,959	$565,959	$836,226	$836,226
1708000403	$253,148	$253,148	$484,555	$484,555	$715,963	$715,963
1708000404	$477,910	$477,910	$914,701	$914,701	$1,351,493	$1,351,493
1708000405	$347,872	$347,872	$665,814	$665,814	$983,756	$983,756
1708000501	$56,230	$56,230	$107,621	$107,621	$159,013	$159,013
1708000502	$27,899	$27,899	$53,406	$53,406	$78,913	$78,913
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$135,115	$135,115	$258,605	$258,605	$382,095	$382,095
1708000505	$59,412	$59,412	$113,712	$113,712	$168,012	$168,012
1708000506	$26,412	$26,412	$50,552	$50,552	$74,692	$74,692
1708000507	$187	$187	$382	$382	$576	$576
1708000508	$0	$0	$0	$0	$0	$0
1709000704	$863	$863	$1,651	$1,651	$2,440	$2,440
1709001101	$300,149	$300,149	$574,473	$574,473	$848,797	$848,797
1709001102	$291,215	$291,215	$557,374	$557,374	$823,533	$823,533
1709001103	$239,793	$239,793	$458,954	$458,954	$678,115	$678,115
1709001104	$399,794	$399,794	$765,190	$765,190	$1,130,586	$1,130,586
1709001105	$65,746	$65,746	$125,836	$125,836	$185,925	$185,925
1709001106	$20,685	$20,685	$39,591	$39,591	$58,497	$58,497
1709001201	$0	$0	$0	$0	$0	$0
1709001202	$19,847	$19,847	$37,985	$37,985	$56,124	$56,124
1709001203	$0	$0	$0	$0	$0	$0

Upper Willamette O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$45,050	$45,050	$86,223	$86,223	$127,397	$127,397
1709000304	$0	$0	$0	$0	$0	$0
1709000306	$28,206	$28,206	$53,984	$53,984	$79,763	$79,763
1709000504	$20,758	$20,758	$39,730	$39,730	$58,702	$58,702
1709000505	$151,918	$151,918	$290,765	$290,765	$429,613	$429,613
1709000506	$3,103	$3,103	$5,940	$5,940	$8,776	$8,776
1709000601	$14,862	$14,862	$28,444	$28,444	$42,027	$42,027
1709000602	$54,253	$54,253	$103,839	$103,839	$153,424	$153,424
1709000603	$40,994	$40,994	$78,461	$78,461	$115,928	$115,928
1709000606	$209,469	$209,469	$400,916	$400,916	$592,363	$592,363
1709000607	$1,389	$1,389	$2,659	$2,659	$3,928	$3,928
1709000608	$9,486	$9,486	$18,155	$18,155	$26,825	$26,825
1709000701	$1,124	$1,124	$2,150	$2,150	$3,177	$3,177
1709000702	$13,376	$13,376	$25,602	$25,602	$37,827	$37,827
1709000703	$43	$43	$82	$82	$121	$121
1709000704	$863	$863	$1,651	$1,651	$2,440	$2,440
1709000801	$52,084	$52,084	$99,686	$99,686	$147,289	$147,289
1709000802	$55,367	$55,367	$105,970	$105,970	$156,573	$156,573
1709000803	$38,382	$38,382	$73,461	$73,461	$108,541	$108,541
1709000804	$4,599	$4,599	$8,802	$8,802	$13,005	$13,005
1709000805	$327	$327	$626	$626	$925	$925
1709000806	$38,475	$38,475	$73,640	$73,640	$108,805	$108,805
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$6,691	$6,691	$12,806	$12,806	$18,922	$18,922
1709000902	$11,765	$11,765	$22,518	$22,518	$33,270	$33,270
1709000903	$4,342	$4,342	$8,309	$8,309	$12,277	$12,277
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$115,310	$115,310	$220,699	$220,699	$326,087	$326,087
1709000906	$11,534	$11,534	$22,076	$22,076	$32,618	$32,618
1709001001	$20,294	$20,294	$38,843	$38,843	$57,391	$57,391
1709001002	$0	$0	$0	$0	$0	$0
1709001003	$12,141	$12,141	$23,238	$23,238	$34,335	$34,335
1709001004	$737	$737	$1,410	$1,410	$2,084	$2,084
1709001005	$0	$0	$0	$0	$0	$0
1709001201	$0	$0	$0	$0	$0	$0
1709001203	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$222	$222	$451	$451	$681	$681
1703000101	$539,861	$539,861	$1,033,281	$1,033,281	$1,526,701	$1,526,701
1703000102	$201,740	$201,740	$386,123	$386,123	$570,505	$570,505
1703000103	$349,120	$349,120	$669,295	$669,295	$989,470	$989,470
1703000104	$32,074	$32,074	$62,213	$62,213	$92,352	$92,352
1703000201	$636,544	$636,544	$1,218,321	$1,218,321	$1,800,098	$1,800,098
1703000202	$440,317	$440,317	$842,749	$842,749	$1,245,181	$1,245,181
1703000203	$494,087	$494,087	$945,873	$945,873	$1,397,659	$1,397,659
1703000301	$2,782	$2,782	$5,420	$5,420	$8,059	$8,059
1703000302	$9,372	$9,372	$19,092	$19,092	$28,812	$28,812
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$13,894	$13,894	$28,303	$28,303	$42,711	$42,711
1703000305	$17	$17	$34	$34	$52	$52
1703000306	$18,890	$18,890	$38,479	$38,479	$58,068	$58,068
1703000307	$14,098	$14,098	$28,718	$28,718	$43,338	$43,338
1707010101	$188	$188	$383	$383	$578	$578
1707010102	$6,131	$6,131	$12,490	$12,490	$18,848	$18,848
1707010105	$1,142	$1,142	$2,326	$2,326	$3,510	$3,510
1707010106	$1,128	$1,128	$2,298	$2,298	$3,468	$3,468
1707010109	$1,335	$1,335	$2,719	$2,719	$4,103	$4,103
1707010110	$2,710	$2,710	$5,520	$5,520	$8,331	$8,331
1707010111	$1,452	$1,452	$2,958	$2,958	$4,464	$4,464
1707010112	$1,619	$1,619	$3,299	$3,299	$4,978	$4,978
1707010113	$10,837	$10,837	$22,075	$22,075	$33,313	$33,313
1707010114	$8,995	$8,995	$17,788	$17,788	$26,580	$26,580
1707010201	$131,052	$131,052	$251,210	$251,210	$371,369	$371,369
1707010202	$76,193	$76,193	$145,857	$145,857	$215,522	$215,522
1707010203	$98,317	$98,317	$188,253	$188,253	$278,190	$278,190
1707010204	$64	$64	$130	$130	$197	$197
1707010207	$65	$65	$133	$133	$201	$201
1707010208	$0	$0	$0	$0	$0	$0
1707010209	$0	$0	$0	$0	$0	$0
1707010210	$55	$55	$111	$111	$168	$168
1707010211	$105	$105	$214	$214	$323	$323
1707010301	$222,305	$222,305	$425,514	$425,514	$628,723	$628,723
1707010302	$207,838	$207,838	$401,292	$401,292	$594,746	$594,746
1707010303	$5,755	$5,755	$11,163	$11,163	$16,571	$16,571
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$14,234	$14,234	$28,099	$28,099	$41,964	$41,964
1707010306	$68,965	$68,965	$132,189	$132,189	$195,412	$195,412

Middle Columbia River O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$693	$693	$1,413	$1,413	$2,132	$2,132
1707010313	$1,049	$1,049	$2,136	$2,136	$3,223	$3,223
1707010501	$3,155	$3,155	$6,047	$6,047	$8,938	$8,938
1707010502	$45,668	$45,668	$87,407	$87,407	$129,145	$129,145
1707010503	$57,955	$57,955	$110,923	$110,923	$163,892	$163,892
1707010504	$52,866	$52,866	$101,184	$101,184	$149,503	$149,503
1707010505	$3,719	$3,719	$7,117	$7,117	$10,516	$10,516
1707010512	$73,316	$73,316	$140,324	$140,324	$207,332	$207,332
1707010513	$141,887	$141,887	$271,578	$271,578	$401,269	$401,269
1707010601	$476	$476	$912	$912	$1,347	$1,347
1707010602	$96	$96	$190	$190	$284	$284
1707010603	$216	$216	$439	$439	$663	$663
1707010604	$4,901	$4,901	$9,983	$9,983	$15,065	$15,065
1707020103	$165,922	$165,922	$324,645	$324,645	$483,367	$483,367
1707020104	$133,554	$133,554	$268,430	$268,430	$403,305	$403,305
1707020105	$192,179	$192,179	$368,454	$368,454	$544,729	$544,729
1707020106	$89,256	$89,256	$181,602	$181,602	$273,947	$273,947
1707020107	$106,707	$106,707	$216,098	$216,098	$325,489	$325,489
1707020108	$103,953	$103,953	$209,042	$209,042	$314,130	$314,130
1707020109	$69,379	$69,379	$140,594	$140,594	$211,809	$211,809
1707020110	$60,248	$60,248	$121,365	$121,365	$182,482	$182,482
1707020111	$69,191	$69,191	$137,402	$137,402	$205,613	$205,613
1707020112	$116,100	$116,100	$222,210	$222,210	$328,320	$328,320
1707020113	$66,828	$66,828	$127,906	$127,906	$188,985	$188,985
1707020114	$82,946	$82,946	$158,755	$158,755	$234,564	$234,564
1707020115	$114,588	$114,588	$219,318	$219,318	$324,047	$324,047
1707020201	$153,423	$153,423	$302,006	$302,006	$450,589	$450,589
1707020202	$217,628	$217,628	$424,740	$424,740	$631,852	$631,852
1707020203	$292,695	$292,695	$560,519	$560,519	$828,343	$828,343
1707020204	$175,624	$175,624	$336,172	$336,172	$496,720	$496,720
1707020205	$254,253	$254,253	$488,564	$488,564	$722,876	$722,876
1707020206	$181,935	$181,935	$348,472	$348,472	$515,009	$515,009
1707020207	$322,199	$322,199	$617,021	$617,021	$911,843	$911,843
1707020208	$297,741	$297,741	$569,865	$569,865	$841,988	$841,988
1707020209	$77,755	$77,755	$155,395	$155,395	$233,035	$233,035
1707020210	$78,708	$78,708	$151,366	$151,366	$224,024	$224,024
1707020301	$123,054	$123,054	$250,650	$250,650	$378,247	$378,247
1707020302	$197,103	$197,103	$400,842	$400,842	$604,580	$604,580

Middle Columbia River O. mykiss ESU						
Watershed	Annual Federal Lands Management Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$129,762	$129,762	$256,758	$256,758	$383,753	$383,753
1707020304	$50,812	$50,812	$103,124	$103,124	$155,435	$155,435
1707020305	$8,107	$8,107	$15,517	$15,517	$22,927	$22,927
1707020401	$140,095	$140,095	$268,137	$268,137	$396,178	$396,178
1707020402	$101,659	$101,659	$194,571	$194,571	$287,483	$287,483
1707020403	$235,217	$235,217	$450,196	$450,196	$665,175	$665,175
1707020404	$134,150	$134,150	$256,758	$256,758	$379,366	$379,366
1707020405	$89,997	$89,997	$172,252	$172,252	$254,506	$254,506
1707020406	$1,006	$1,006	$1,925	$1,925	$2,844	$2,844
1707020407	$36,860	$36,860	$70,548	$70,548	$104,236	$104,236
1707020408	$22,328	$22,328	$42,735	$42,735	$63,142	$63,142
1707020409	$90,730	$90,730	$173,655	$173,655	$256,579	$256,579
1707020410	$72,414	$72,414	$138,598	$138,598	$204,781	$204,781
1707020411	$48,335	$48,335	$92,616	$92,616	$136,896	$136,896
1707020412	$7,020	$7,020	$13,513	$13,513	$20,006	$20,006
1707020413	$2,596	$2,596	$4,969	$4,969	$7,342	$7,342
1707020414	$10,568	$10,568	$20,226	$20,226	$29,884	$29,884
1707030603	$10,213	$10,213	$19,547	$19,547	$28,881	$28,881
1707030604	$9,626	$9,626	$18,424	$18,424	$27,221	$27,221
1707030605	$3,970	$3,970	$7,598	$7,598	$11,226	$11,226
1707030606	$30,276	$30,276	$57,946	$57,946	$85,617	$85,617
1707030607	$44,164	$44,164	$84,529	$84,529	$124,894	$124,894
1707030608	$5,522	$5,522	$10,570	$10,570	$15,617	$15,617
1707030610	$328,172	$328,172	$628,108	$628,108	$928,044	$928,044
1707030611	$20,025	$20,025	$38,328	$38,328	$56,630	$56,630
1707030612	$73,242	$73,242	$140,182	$140,182	$207,122	$207,122
1707030701	$80,928	$80,928	$154,892	$154,892	$228,857	$228,857
1707030702	$25,539	$25,539	$48,881	$48,881	$72,223	$72,223
1707030704	$25,067	$25,067	$50,723	$50,723	$76,378	$76,378
1707030705	$9,259	$9,259	$17,721	$17,721	$26,184	$26,184
1708000107	$123,647	$123,647	$236,655	$236,655	$349,663	$349,663

Appendix F.5
Annual Grazing Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$0	$0	$0	$0	$0	$0
1711000202	$0	$0	$0	$0	$0	$0
1711000204	$0	$0	$0	$0	$0	$0
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$0	$0	$0	$0
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$0	$0	$0	$0	$0	$0
1711000405	$0	$0	$0	$0	$0	$0
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$0	$0	$0	$0	$0	$0
1711000506	$24	$24	$65	$65	$105	$105
1711000507	$0	$0	$0	$0	$0	$0
1711000508	$20	$20	$53	$53	$85	$85
1711000601	$26	$26	$68	$68	$111	$111
1711000602	$3	$3	$8	$8	$13	$13
1711000603	$6	$6	$15	$15	$25	$25
1711000604	$0	$0	$0	$0	$0	$0
1711000701	$13	$13	$35	$35	$57	$57
1711000702	$0	$0	$0	$0	$0	$0
1711000801	$2	$2	$4	$4	$7	$7
1711000802	$2	$2	$5	$5	$8	$8
1711000803	$0	$0	$0	$0	$0	$0
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$27	$27	$72	$72	$116	$116
1711000903	$15	$15	$41	$41	$66	$66
1711000904	$0	$0	$1	$1	$2	$2
1711000905	$0	$0	$0	$0	$0	$0
1711001003	$0	$0	$0	$0	$0	$0
1711001004	$0	$0	$0	$0	$0	$0
1711001101	$0	$0	$0	$0	$0	$0
1711001102	$0	$0	$0	$0	$0	$0
1711001201	$0	$0	$0	$0	$0	$0
1711001202	$0	$0	$0	$0	$0	$0
1711001203	$0	$0	$0	$0	$0	$0
1711001204	$0	$0	$0	$0	$0	$0
1711001301	$0	$0	$1	$1	$1	$1

Puget Sound chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$0	$0	$0	$0	$0	$0
1711001303	$0	$0	$0	$0	$0	$0
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$0	$0	$0	$0	$0	$0
1711001403	$0	$0	$0	$0	$0	$0
1711001404	$0	$0	$0	$0	$0	$0
1711001405	$0	$0	$0	$0	$0	$0
1711001502	$1	$1	$2	$2	$3	$3
1711001503	$0	$0	$0	$0	$0	$0
1711001601	$0	$0	$0	$0	$0	$0
1711001602	$0	$0	$0	$0	$0	$0
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001808	$0	$0	$0	$0	$0	$0
1711001900	$0	$0	$0	$0	$0	$0
1711001901	$0	$0	$0	$0	$0	$0
1711001902	$0	$0	$0	$0	$0	$0
1711001904	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$0	$0	$0	$0
1711002004	$0	$0	$0	$0	$0	$0
1711002007	$0	$0	$0	$0	$0	$0
N01	$0	$0	$0	$0	$0	$0
N02	$0	$0	$0	$0	$0	$0
N03	$0	$0	$0	$0	$0	$0
N04	$0	$0	$0	$0	$0	$0
N05	$0	$0	$0	$0	$0	$0
N06	$0	$0	$0	$0	$0	$0
N07	$0	$0	$0	$0	$0	$0
N08	$0	$0	$0	$0	$0	$0
N09	$0	$0	$0	$0	$0	$0
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$0	$0	$0	$0	$0	$0
N13	$0	$0	$0	$0	$0	$0
N14	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$33	$33	$86	$86	$139	$139
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$9	$9	$25	$25	$41	$41
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$16	$16	$42	$42	$68	$68
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$4	$4	$11	$11	$18	$18
1708000109	$24	$24	$62	$62	$100	$100
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000302	$2	$2	$6	$6	$10	$10
1708000303	$2	$2	$6	$6	$10	$10
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$22	$22	$58	$58	$95	$95
1708000401	$7	$7	$19	$19	$31	$31
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$4	$4	$9	$9	$15	$15

Lower Columbia River chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$2	$2	$5	$5	$9	$9
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1708000601	$0	$0	$0	$0	$0	$0
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$5	$5	$14	$14	$23	$23
1709000704	$8	$8	$22	$22	$36	$36
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$19	$19	$49	$49	$79	$79
1709001201	$7	$7	$18	$18	$29	$29
1709001202	$6	$6	$17	$17	$27	$27
1709001203	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$0	$0	$0	$0
1709000201	$0	$0	$0	$0	$0	$0
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$0	$0	$0	$0	$0	$0
1709000205	$0	$0	$0	$0	$0	$0
1709000301	$0	$0	$0	$0	$0	$0
1709000302	$0	$0	$0	$0	$0	$0
1709000303	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$0	$0	$0	$0	$0	$0
1709000305	$0	$0	$0	$0	$0	$0
1709000306	$9	$9	$25	$25	$40	$40
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$31	$31	$81	$81	$130	$130
1709000602	$43	$43	$114	$114	$185	$185
1709000603	$33	$33	$86	$86	$140	$140
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$0	$0	$0	$0
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$0	$0	$0	$0
1709000704	$8	$8	$22	$22	$36	$36
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$16	$16	$43	$43	$70	$70
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$4	$4	$10	$10	$16	$16
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$5	$5	$12	$12	$19	$19
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$47	$47	$124	$124	$200	$200
1709000906	$21	$21	$54	$54	$88	$88
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$6	$6	$16	$16	$26	$26
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$19	$19	$49	$49	$79	$79
1709001201	$7	$7	$18	$18	$29	$29

Upper Willamette River chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$0	$0	$0	$0	$0	$0

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$0	$0	$0	$0
1702000801	$16	$16	$41	$41	$67	$67
1702000802	$15	$15	$39	$39	$63	$63
1702000803	$15	$15	$39	$39	$63	$63
1702000804	$10	$10	$26	$26	$42	$42
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$17	$17	$44	$44	$72	$72
1702000807	$4	$4	$12	$12	$19	$19
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$0	$0	$0	$0	$0	$0
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$19	$19	$51	$51	$82	$82
1702001101	$11	$11	$29	$29	$47	$47
1702001102	$15	$15	$39	$39	$63	$63
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$17	$17	$45	$45	$73	$73
1702001105	$0	$0	$0	$0	$0	$0
1702001604	$8	$8	$21	$21	$35	$35
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$10	$10	$27	$27	$44	$44
1707010101	$1	$1	$3	$3	$5	$5
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$15	$15	$41	$41	$66	$66
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$9	$9	$25	$25	$41	$41
1708000107	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$0	$0	$0	$0	$0	$0
1710020201	$0	$0	$0	$0	$0	$0
1710020202	$14	$14	$37	$37	$59	$59
1710020203	$17	$17	$44	$44	$72	$72
1710020204	$2	$2	$5	$5	$8	$8
1710020205	$3	$3	$7	$7	$11	$11
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$1	$1	$1	$1
1710020302	$6	$6	$16	$16	$26	$26
1710020303	$1	$1	$2	$2	$3	$3
1710020304	$0	$0	$0	$0	$1	$1
1710020305	$0	$0	$0	$0	$0	$0
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$1	$1	$2	$2	$3	$3
1710020308	$1	$1	$1	$1	$2	$2
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$0	$0	$1	$1	$2	$2
1710020402	$22	$22	$57	$57	$92	$92
1710020403	$1	$1	$3	$3	$5	$5
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$0	$0	$0	$0	$0	$0
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$12	$12	$31	$31	$50	$50
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$1	$1	$2	$2	$3	$3
1710020504	$0	$0	$0	$0	$0	$0
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$1	$1	$1	$1
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$10	$10	$26	$26	$42	$42
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$2	$2	$5	$5	$9	$9
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$5	$5	$13	$13	$20	$20
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$1	$1	$3	$3	$5	$5
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$33	$33	$86	$86	$139	$139
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$0	$0	$0	$0	$0	$0
1710030112	$0	$0	$0	$0	$0	$0
1710030201	$10	$10	$27	$27	$43	$43
1710030202	$9	$9	$25	$25	$40	$40
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$7	$7	$19	$19	$31	$31
1710030205	$6	$6	$15	$15	$25	$25
1710030207	$10	$10	$27	$27	$44	$44
1710030208	$4	$4	$11	$11	$19	$19
1710030209	$0	$0	$0	$0	$0	$0
1710030210	$11	$11	$29	$29	$47	$47
1710030211	$6	$6	$15	$15	$25	$25
1710030212	$21	$21	$54	$54	$88	$88
1710030213	$0	$0	$0	$0	$0	$0
1710030301	$0	$0	$1	$1	$1	$1
1710030302	$0	$0	$0	$0	$0	$0
1710030303	$0	$0	$0	$0	$0	$0
1710030304	$4	$4	$9	$9	$15	$15
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$9	$9	$24	$24	$38	$38
1710030308	$8	$8	$21	$21	$34	$34
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$0	$0	$0	$0
1710030404	$11	$11	$29	$29	$47	$47
1710030501	$14	$14	$37	$37	$61	$61
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$7	$7	$18	$18	$30	$30
1710030504	$11	$11	$29	$29	$46	$46
1710030505	$0	$0	$0	$0	$0	$0
1710030506	$0	$0	$0	$0	$0	$0
1710030603	$0	$0	$0	$0	$0	$0
1710030604	$20	$20	$53	$53	$86	$86

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001807	$0	$0	$0	$0	$0	$0
1711001808	$0	$0	$0	$0	$0	$0
1711001908	$0	$0	$0	$0	$0	$0
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$9	$9	$25	$25	$41	$41
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000109	$24	$24	$62	$62	$100	$100
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$5	$5	$14	$14	$23	$23

Ozette Lake sockeye salmon ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$1	$1	$2	$2	$4	$4
1702000504	$20	$20	$53	$53	$86	$86
1702000505	$0	$0	$0	$0	$0	$0
1702000601	$0	$0	$0	$0	$0	$0
1702000602	$0	$0	$0	$0	$0	$0
1702000603	$25	$25	$67	$67	$108	$108
1702000604	$17	$17	$46	$46	$74	$74
1702000605	$17	$17	$46	$46	$74	$74
1702000704	$8	$8	$21	$21	$34	$34
1702000801	$16	$16	$41	$41	$67	$67
1702000802	$15	$15	$39	$39	$63	$63
1702000803	$15	$15	$39	$39	$63	$63
1702000804	$10	$10	$26	$26	$42	$42
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$17	$17	$44	$44	$72	$72
1702000807	$4	$4	$12	$12	$19	$19
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$0	$0	$0	$0	$0	$0
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$19	$19	$51	$51	$82	$82
1702001101	$11	$11	$29	$29	$47	$47
1702001102	$15	$15	$39	$39	$63	$63
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$17	$17	$45	$45	$73	$73

Upper Columbia River O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$0	$0	$0	$0	$0	$0
1702001204	$0	$0	$0	$0	$0	$0
1702001509	$10	$10	$26	$26	$42	$42
1702001604	$8	$8	$21	$21	$35	$35
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$10	$10	$27	$27	$44	$44
1707010101	$1	$1	$3	$3	$5	$5
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$15	$15	$41	$41	$66	$66
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$9	$9	$25	$25	$41	$41
1708000107	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$10	$10	$27	$27	$44	$44
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$3	$3	$7	$7	$11	$11
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$2	$2	$5	$5	$7	$7
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$2	$2	$4	$4	$7	$7
1706010401	$26	$26	$69	$69	$112	$112
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$12	$12	$31	$31	$51	$51
1706010406	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$0	$0	$0	$0	$0	$0
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$0	$0	$0	$0	$0	$0
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$2	$2	$4	$4	$7	$7
1706010501	$0	$0	$0	$0	$0	$0
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$2	$2	$6	$6	$10	$10
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$4	$4	$10	$10	$16	$16
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$10	$10	$26	$26	$42	$42
1706010606	$12	$12	$32	$32	$52	$52
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$0	$0	$1	$1	$1	$1
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$1	$1	$2	$2	$4	$4
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$0	$0	$0	$0	$0	$0
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$1	$1	$3	$3	$5	$5
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$16	$16	$42	$42	$69	$69
1706020104	$16	$16	$42	$42	$69	$69
1706020105	$13	$13	$35	$35	$57	$57
1706020107	$14	$14	$36	$36	$59	$59
1706020108	$20	$20	$51	$51	$83	$83
1706020109	$10	$10	$28	$28	$45	$45
1706020110	$17	$17	$45	$45	$73	$73
1706020111	$4	$4	$10	$10	$16	$16
1706020112	$8	$8	$22	$22	$36	$36
1706020113	$15	$15	$39	$39	$63	$63

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$5	$5	$14	$14	$22	$22
1706020115	$5	$5	$13	$13	$21	$21
1706020117	$5	$5	$12	$12	$20	$20
1706020118	$1	$1	$2	$2	$4	$4
1706020119	$11	$11	$30	$30	$48	$48
1706020120	$4	$4	$11	$11	$18	$18
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$5	$5	$14	$14	$23	$23
1706020123	$6	$6	$15	$15	$24	$24
1706020124	$3	$3	$8	$8	$13	$13
1706020125	$6	$6	$16	$16	$26	$26
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$7	$7	$20	$20	$32	$32
1706020128	$13	$13	$34	$34	$55	$55
1706020129	$5	$5	$13	$13	$21	$21
1706020130	$11	$11	$29	$29	$47	$47
1706020132	$18	$18	$47	$47	$76	$76
1706020201	$19	$19	$49	$49	$80	$80
1706020202	$28	$28	$73	$73	$118	$118
1706020203	$9	$9	$23	$23	$37	$37
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$4	$4	$11	$11	$18	$18
1706020304	$4	$4	$10	$10	$16	$16
1706020305	$19	$19	$51	$51	$82	$82
1706020306	$19	$19	$49	$49	$80	$80
1706020307	$6	$6	$16	$16	$26	$26
1706020308	$7	$7	$17	$17	$28	$28
1706020309	$9	$9	$25	$25	$40	$40
1706020310	$13	$13	$34	$34	$54	$54
1706020311	$14	$14	$37	$37	$60	$60
1706020312	$23	$23	$61	$61	$98	$98
1706020313	$13	$13	$33	$33	$54	$54
1706020314	$9	$9	$25	$25	$40	$40
1706020315	$11	$11	$28	$28	$46	$46
1706020316	$7	$7	$19	$19	$30	$30
1706020317	$6	$6	$16	$16	$27	$27
1706020318	$7	$7	$17	$17	$28	$28
1706020319	$14	$14	$38	$38	$62	$62
1706020320	$3	$3	$9	$9	$14	$14

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$9	$9	$25	$25	$40	$40
1706020323	$6	$6	$17	$17	$27	$27
1706020401	$9	$9	$24	$24	$39	$39
1706020402	$11	$11	$28	$28	$45	$45
1706020403	$12	$12	$31	$31	$51	$51
1706020404	$7	$7	$18	$18	$29	$29
1706020405	$8	$8	$21	$21	$35	$35
1706020406	$10	$10	$26	$26	$42	$42
1706020407	$9	$9	$23	$23	$38	$38
1706020408	$14	$14	$36	$36	$59	$59
1706020409	$10	$10	$27	$27	$43	$43
1706020414	$22	$22	$59	$59	$95	$95
1706020501	$3	$3	$8	$8	$13	$13
1706020502	$1	$1	$2	$2	$3	$3
1706020503	$0	$0	$1	$1	$2	$2
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$12	$12	$32	$32	$52	$52
1706020507	$0	$0	$1	$1	$1	$1
1706020508	$32	$32	$83	$83	$135	$135
1706020509	$2	$2	$4	$4	$7	$7
1706020510	$0	$0	$0	$0	$1	$1
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$5	$5	$13	$13	$21	$21
1706020604	$0	$0	$0	$0	$1	$1
1706020605	$9	$9	$24	$24	$38	$38
1706020606	$7	$7	$17	$17	$28	$28
1706020607	$0	$0	$1	$1	$1	$1
1706020608	$2	$2	$6	$6	$9	$9
1706020609	$8	$8	$20	$20	$33	$33
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$3	$3	$7	$7	$12	$12
1706020702	$10	$10	$26	$26	$43	$43
1706020703	$8	$8	$22	$22	$35	$35
1706020704	$9	$9	$23	$23	$38	$38
1706020705	$22	$22	$59	$59	$96	$96
1706020706	$4	$4	$11	$11	$18	$18
1706020707	$10	$10	$26	$26	$42	$42
1706020708	$17	$17	$45	$45	$74	$74
1706020709	$19	$19	$51	$51	$83	$83
1706020710	$4	$4	$11	$11	$18	$18
1706020711	$6	$6	$16	$16	$26	$26
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$1	$1
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$1	$1	$2	$2	$3	$3
1706020805	$7	$7	$19	$19	$31	$31
1706020806	$6	$6	$15	$15	$24	$24
1706020807	$14	$14	$36	$36	$58	$58
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$1	$1	$1	$1
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$1	$1
1706020812	$0	$0	$0	$0	$1	$1
1706020813	$6	$6	$17	$17	$27	$27
1706020814	$11	$11	$28	$28	$45	$45
1706020815	$8	$8	$20	$20	$33	$33
1706020901	$2	$2	$5	$5	$8	$8
1706020902	$1	$1	$1	$1	$2	$2
1706020903	$0	$0	$1	$1	$1	$1

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$1	$1	$3	$3	$5	$5
1706020905	$2	$2	$6	$6	$10	$10
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$1	$1	$3	$3	$4	$4
1706020908	$10	$10	$26	$26	$42	$42
1706020909	$3	$3	$8	$8	$13	$13
1706020910	$4	$4	$10	$10	$16	$16
1706020911	$22	$22	$57	$57	$93	$93
1706020912	$14	$14	$36	$36	$58	$58
1706020913	$9	$9	$24	$24	$40	$40
1706020914	$6	$6	$15	$15	$24	$24
1706020915	$9	$9	$24	$24	$39	$39
1706020916	$11	$11	$30	$30	$48	$48
1706020917	$0	$0	$0	$0	$1	$1
1706021001	$9	$9	$23	$23	$37	$37
1706021002	$11	$11	$29	$29	$47	$47
1706021003	$7	$7	$19	$19	$30	$30
1706021006	$6	$6	$17	$17	$27	$27
1706021007	$17	$17	$46	$46	$75	$75
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$8	$8	$21	$21	$34	$34
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$5	$5	$13	$13	$21	$21
1706030202	$0	$0	$1	$1	$1	$1
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$10	$10	$26	$26	$42	$42
1706030212	$5	$5	$14	$14	$23	$23
1706030213	$8	$8	$20	$20	$32	$32

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$6	$6	$16	$16	$26	$26
1706030301	$1	$1	$4	$4	$6	$6
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$1	$1	$4	$4	$6	$6
1706030402	$12	$12	$31	$31	$50	$50
1706030501	$10	$10	$27	$27	$44	$44
1706030502	$7	$7	$18	$18	$29	$29
1706030503	$14	$14	$36	$36	$58	$58
1706030504	$14	$14	$36	$36	$59	$59
1706030505	$11	$11	$30	$30	$48	$48
1706030506	$13	$13	$35	$35	$57	$57
1706030507	$27	$27	$72	$72	$116	$116
1706030508	$12	$12	$32	$32	$52	$52
1706030509	$9	$9	$25	$25	$40	$40
1706030510	$19	$19	$51	$51	$82	$82
1706030511	$6	$6	$17	$17	$28	$28
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$0	$0	$0	$0	$0	$0
1706030602	$0	$0	$0	$0	$1	$1
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$12	$12	$31	$31	$50	$50
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$1	$1	$2	$2	$3	$3
1706030611	$0	$0	$1	$1	$1	$1

Snake River Basin O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$0	$0	$0	$0	$0	$0
1706030613	$3	$3	$7	$7	$11	$11
1706030614	$0	$0	$0	$0	$0	$0
1706030615	$1	$1	$2	$2	$4	$4
1706030616	$4	$4	$10	$10	$16	$16
1706030617	$2	$2	$6	$6	$10	$10
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$4	$4	$9	$9	$15	$15
1706030620	$0	$0	$1	$1	$1	$1
1706030621	$0	$0	$1	$1	$2	$2
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$0	$0	$0	$0	$0	$0
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$1	$1	$3	$3	$5	$5
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$15	$15	$41	$41	$66	$66
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$9	$9	$25	$25	$41	$41
1708000107	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$33	$33	$86	$86	$139	$139
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$9	$9	$25	$25	$41	$41
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$16	$16	$42	$42	$68	$68
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$4	$4	$11	$11	$18	$18
1708000109	$24	$24	$62	$62	$100	$100
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000401	$7	$7	$19	$19	$31	$31
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$4	$4	$9	$9	$15	$15
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$2	$2	$5	$5	$9	$9
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1709000704	$8	$8	$22	$22	$36	$36
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$6	$6	$16	$16	$26	$26
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$19	$19	$49	$49	$79	$79
1709001201	$7	$7	$18	$18	$29	$29
1709001202	$6	$6	$17	$17	$27	$27
1709001203	$0	$0	$0	$0	$0	$0

Upper Willamette O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$0	$0	$0	$0	$0	$0
1709000304	$0	$0	$0	$0	$0	$0
1709000306	$9	$9	$25	$25	$40	$40
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$31	$31	$81	$81	$130	$130
1709000602	$43	$43	$114	$114	$185	$185
1709000603	$33	$33	$86	$86	$140	$140
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$0	$0	$0	$0
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$0	$0	$0	$0
1709000704	$8	$8	$22	$22	$36	$36
1709000801	$0	$0	$0	$0	$0	$0
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$16	$16	$43	$43	$70	$70
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$4	$4	$10	$10	$16	$16
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$5	$5	$12	$12	$19	$19
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$47	$47	$124	$124	$200	$200
1709000906	$21	$21	$54	$54	$88	$88
1709001001	$5	$5	$14	$14	$23	$23
1709001002	$37	$37	$96	$96	$156	$156
1709001003	$0	$0	$0	$0	$0	$0
1709001004	$0	$0	$0	$0	$0	$0
1709001005	$13	$13	$35	$35	$57	$57
1709001201	$7	$7	$18	$18	$29	$29
1709001203	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$10	$10	$27	$27	$44	$44
1703000101	$0	$0	$0	$0	$0	$0
1703000102	$0	$0	$0	$0	$0	$0
1703000103	$0	$0	$0	$0	$0	$0
1703000104	$0	$0	$0	$0	$0	$0
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$0	$0	$0	$0	$0	$0
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$0	$0	$0	$0	$0	$0
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$0	$0	$0	$0	$0	$0
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$0	$0	$0	$0	$0	$0
1703000307	$0	$0	$0	$0	$0	$0
1707010101	$1	$1	$3	$3	$5	$5
1707010102	$0	$0	$0	$0	$0	$0
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$15	$15	$41	$41	$66	$66
1707010110	$16	$16	$41	$41	$67	$67
1707010111	$7	$7	$17	$17	$28	$28
1707010112	$0	$0	$0	$0	$0	$0
1707010113	$13	$13	$34	$34	$54	$54
1707010114	$0	$0	$0	$0	$0	$0
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$1	$1	$2	$2	$4	$4
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$0	$0	$0	$0	$0	$0
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$0	$0	$0	$0	$0	$0
1707010209	$0	$0	$0	$0	$0	$0
1707010210	$10	$10	$27	$27	$44	$44
1707010211	$0	$0	$0	$0	$0	$0
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$9	$9	$24	$24	$39	$39
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$25	$25	$66	$66	$107	$107
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$1	$1	$4	$4	$6	$6
1707010313	$17	$17	$45	$45	$74	$74
1707010501	$0	$0	$0	$0	$0	$0
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$7	$7	$18	$18	$28	$28
1707010504	$0	$0	$0	$0	$0	$0
1707010505	$15	$15	$40	$40	$65	$65
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$9	$9	$25	$25	$41	$41
1707010601	$7	$7	$20	$20	$32	$32
1707010602	$10	$10	$27	$27	$44	$44
1707010603	$0	$0	$0	$0	$0	$0
1707010604	$0	$0	$0	$0	$0	$0
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$8	$8	$21	$21	$34	$34
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$6	$6	$15	$15	$25	$25
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$0	$0	$0	$0
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$6	$6	$15	$15	$24	$24
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$13	$13	$36	$36	$58	$58
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$9	$9	$24	$24	$40	$40
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$19	$19	$51	$51	$82	$82

Middle Columbia River O. mykiss ESU						
Watershed	Annual Grazing Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$11	$11	$28	$28	$45	$45
1707020401	$0	$0	$0	$0	$0	$0
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$0	$0	$0	$0	$0	$0
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$5	$5	$14	$14	$23	$23
1707030603	$0	$0	$0	$0	$0	$0
1707030604	$1	$1	$3	$3	$5	$5
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$0	$0	$0	$0
1707030611	$4	$4	$12	$12	$19	$19
1707030612	$4	$4	$10	$10	$17	$17
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$10	$10	$27	$27	$44	$44
1707030704	$8	$8	$22	$22	$36	$36
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Appendix F.6
Annual Transportation Project Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$0	$0	$0	$0	$0	$0
1711000202	$70,586	$70,586	$70,586	$70,586	$70,586	$70,586
1711000204	$7,976	$7,976	$7,976	$7,976	$7,976	$7,976
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$0	$0	$0	$0
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$0	$0	$0	$0	$0	$0
1711000405	$40,225	$40,225	$40,225	$40,225	$40,225	$40,225
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$23,715	$23,715	$23,715	$23,715	$23,715	$23,715
1711000506	$0	$0	$0	$0	$0	$0
1711000507	$7,972	$7,972	$7,972	$7,972	$7,972	$7,972
1711000508	$0	$0	$0	$0	$0	$0
1711000601	$0	$0	$0	$0	$0	$0
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$0	$0	$0	$0
1711000604	$0	$0	$0	$0	$0	$0
1711000701	$7,971	$7,971	$7,971	$7,971	$7,971	$7,971
1711000702	$30,810	$30,810	$30,810	$30,810	$30,810	$30,810
1711000801	$24,467	$24,467	$24,467	$24,467	$24,467	$24,467
1711000802	$0	$0	$0	$0	$0	$0
1711000803	$6,994	$6,994	$6,994	$6,994	$6,994	$6,994
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$14,957	$14,957	$14,957	$14,957	$14,957	$14,957
1711000903	$6,989	$6,989	$6,989	$6,989	$6,989	$6,989
1711000904	$0	$0	$0	$0	$0	$0
1711000905	$124,450	$124,450	$124,450	$124,450	$124,450	$124,450
1711001003	$24,586	$24,586	$24,586	$24,586	$24,586	$24,586
1711001004	$0	$0	$0	$0	$0	$0
1711001101	$25,074	$25,074	$25,074	$25,074	$25,074	$25,074
1711001102	$52,305	$52,305	$52,305	$52,305	$52,305	$52,305
1711001201	$0	$0	$0	$0	$0	$0
1711001202	$38,634	$38,634	$38,634	$38,634	$38,634	$38,634
1711001203	$160,936	$160,936	$160,936	$160,936	$160,936	$160,936
1711001204	$119,054	$119,054	$119,054	$119,054	$119,054	$119,054
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$0	$0	$0	$0	$0	$0
1711001303	$107,547	$107,547	$107,547	$107,547	$107,547	$107,547
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$64,225	$64,225	$64,225	$64,225	$64,225	$64,225
1711001403	$12,228	$12,228	$12,228	$12,228	$12,228	$12,228
1711001404	$0	$0	$0	$0	$0	$0
1711001405	$191,443	$191,443	$191,443	$191,443	$191,443	$191,443
1711001502	$0	$0	$0	$0	$0	$0
1711001503	$20,982	$20,982	$20,982	$20,982	$20,982	$20,982
1711001601	$0	$0	$0	$0	$0	$0
1711001602	$0	$0	$0	$0	$0	$0
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001808	$20,990	$20,990	$20,990	$20,990	$20,990	$20,990
1711001900	$0	$0	$0	$0	$0	$0
1711001901	$83,492	$83,492	$83,492	$83,492	$83,492	$83,492
1711001902	$0	$0	$0	$0	$0	$0
1711001904	$32,279	$32,279	$32,279	$32,279	$32,279	$32,279
1711002003	$0	$0	$0	$0	$0	$0
1711002004	$12,174	$12,174	$12,174	$12,174	$12,174	$12,174
1711002007	$0	$0	$0	$0	$0	$0
N01	$7,975	$7,975	$7,975	$7,975	$7,975	$7,975
N02	$0	$0	$0	$0	$0	$0
N03	$0	$0	$0	$0	$0	$0
N04	$0	$0	$0	$0	$0	$0
N05	$0	$0	$0	$0	$0	$0
N06	$16,038	$16,038	$16,038	$16,038	$16,038	$16,038
N07	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000
N08	$0	$0	$0	$0	$0	$0
N09	$0	$0	$0	$0	$0	$0
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$0	$0	$0	$0	$0	$0
N13	$0	$0	$0	$0	$0	$0
N14	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$6,977	$6,977	$6,977	$6,977	$6,977	$6,977
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$18,012	$18,012	$18,012	$18,012	$18,012	$18,012
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$24,443	$24,443	$24,443	$24,443	$24,443	$24,443
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$27,881	$27,881	$27,881	$27,881	$27,881	$27,881
1707010513	$29,297	$29,297	$29,297	$29,297	$29,297	$29,297
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$14,039	$14,039	$14,039	$14,039	$14,039	$14,039
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$25,650	$25,650	$25,650	$25,650	$25,650	$25,650
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$35,290	$35,290	$35,290	$35,290	$35,290	$35,290
1708000107	$85,303	$85,303	$85,303	$85,303	$85,303	$85,303
1708000108	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1708000109	$179,114	$179,114	$179,114	$179,114	$179,114	$179,114
1708000205	$248,201	$248,201	$248,201	$248,201	$248,201	$248,201
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$20,946	$20,946	$20,946	$20,946	$20,946	$20,946
1708000302	$14,027	$14,027	$14,027	$14,027	$14,027	$14,027
1708000303	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$0	$0	$0	$0	$0	$0
1708000401	$12,111	$12,111	$12,111	$12,111	$12,111	$12,111
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$6,971	$6,971	$6,971	$6,971	$6,971	$6,971
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$23,917	$23,917	$23,917	$23,917	$23,917	$23,917
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$63,268	$63,268	$63,268	$63,268	$63,268	$63,268
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$107,539	$107,539	$107,539	$107,539	$107,539	$107,539
1708000508	$0	$0	$0	$0	$0	$0
1708000601	$18,929	$18,929	$18,929	$18,929	$18,929	$18,929
1708000602	$19,054	$19,054	$19,054	$19,054	$19,054	$19,054
1708000603	$0	$0	$0	$0	$0	$0
1709000704	$61,035	$61,035	$61,035	$61,035	$61,035	$61,035
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$26,581	$26,581	$26,581	$26,581	$26,581	$26,581
1709001201	$70,874	$70,874	$70,874	$70,874	$70,874	$70,874
1709001202	$19,345	$19,345	$19,345	$19,345	$19,345	$19,345
1709001203	$220,630	$220,630	$220,630	$220,630	$220,630	$220,630

Upper Willamette River chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$18,682	$18,682	$18,682	$18,682	$18,682	$18,682
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$0	$0	$0	$0
1709000201	$0	$0	$0	$0	$0	$0
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$0	$0	$0	$0	$0	$0
1709000205	$0	$0	$0	$0	$0	$0
1709000301	$20,998	$20,998	$20,998	$20,998	$20,998	$20,998
1709000302	$59,632	$59,632	$59,632	$59,632	$59,632	$59,632
1709000303	$12,128	$12,128	$12,128	$12,128	$12,128	$12,128

Upper Willamette River chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$13,009	$13,009	$13,009	$13,009	$13,009	$13,009
1709000305	$24,026	$24,026	$24,026	$24,026	$24,026	$24,026
1709000306	$0	$0	$0	$0	$0	$0
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1709000407	$41,632	$41,632	$41,632	$41,632	$41,632	$41,632
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$37,007	$37,007	$37,007	$37,007	$37,007	$37,007
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1709000702	$18,967	$18,967	$18,967	$18,967	$18,967	$18,967
1709000703	$44,611	$44,611	$44,611	$44,611	$44,611	$44,611
1709000704	$61,035	$61,035	$61,035	$61,035	$61,035	$61,035
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$7,050	$7,050	$7,050	$7,050	$7,050	$7,050
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$26,581	$26,581	$26,581	$26,581	$26,581	$26,581
1709001201	$70,874	$70,874	$70,874	$70,874	$70,874	$70,874

Upper Willamette River chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$220,630	$220,630	$220,630	$220,630	$220,630	$220,630

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$7,975	$7,975	$7,975	$7,975	$7,975	$7,975
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$23,912	$23,912	$23,912	$23,912	$23,912	$23,912
1702000807	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$71,927	$71,927	$71,927	$71,927	$71,927	$71,927
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$0	$0	$0	$0	$0	$0
1702001105	$7,978	$7,978	$7,978	$7,978	$7,978	$7,978
1702001604	$6,974	$6,974	$6,974	$6,974	$6,974	$6,974
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$85,056	$85,056	$85,056	$85,056	$85,056	$85,056
1707010102	$7,040	$7,040	$7,040	$7,040	$7,040	$7,040
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010114	$20,730	$20,730	$20,730	$20,730	$20,730	$20,730
1707010501	$36,572	$36,572	$36,572	$36,572	$36,572	$36,572
1707010504	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010512	$27,881	$27,881	$27,881	$27,881	$27,881	$27,881
1707010513	$29,297	$29,297	$29,297	$29,297	$29,297	$29,297
1708000107	$85,303	$85,303	$85,303	$85,303	$85,303	$85,303

Oregon Coast coho salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$45,177	$45,177	$45,177	$45,177	$45,177	$45,177
1710020201	$18,670	$18,670	$18,670	$18,670	$18,670	$18,670
1710020202	$0	$0	$0	$0	$0	$0
1710020203	$7,059	$7,059	$7,059	$7,059	$7,059	$7,059
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$0	$0	$0	$0
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1710020303	$12,904	$12,904	$12,904	$12,904	$12,904	$12,904
1710020304	$0	$0	$0	$0	$0	$0
1710020305	$8,030	$8,030	$8,030	$8,030	$8,030	$8,030
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$0	$0	$0	$0	$0	$0
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$12,003	$12,003	$12,003	$12,003	$12,003	$12,003
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$17,996	$17,996	$17,996	$17,996	$17,996	$17,996
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$0	$0	$0	$0	$0	$0
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$25,461	$25,461	$25,461	$25,461	$25,461	$25,461
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$12,015	$12,015	$12,015	$12,015	$12,015	$12,015
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$0	$0	$0	$0	$0	$0
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$11,931	$11,931	$11,931	$11,931	$11,931	$11,931
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$11,979	$11,979	$11,979	$11,979	$11,979	$11,979

Oregon Coast coho salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$7,042	$7,042	$7,042	$7,042	$7,042	$7,042
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$17,971	$17,971	$17,971	$17,971	$17,971	$17,971
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$0	$0	$0	$0	$0	$0
1710030112	$0	$0	$0	$0	$0	$0
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$0	$0	$0	$0	$0	$0
1710030207	$0	$0	$0	$0	$0	$0
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$0	$0	$0	$0
1710030210	$0	$0	$0	$0	$0	$0
1710030211	$0	$0	$0	$0	$0	$0
1710030212	$0	$0	$0	$0	$0	$0
1710030213	$11,931	$11,931	$11,931	$11,931	$11,931	$11,931
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$0	$0	$0	$0	$0	$0
1710030303	$18,870	$18,870	$18,870	$18,870	$18,870	$18,870
1710030304	$0	$0	$0	$0	$0	$0
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$0	$0	$0	$0	$0	$0
1710030308	$12,387	$12,387	$12,387	$12,387	$12,387	$12,387
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$0	$0	$0	$0
1710030404	$52,223	$52,223	$52,223	$52,223	$52,223	$52,223
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$12,646	$12,646	$12,646	$12,646	$12,646	$12,646
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$0	$0	$0	$0	$0	$0
1710030506	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1710030603	$0	$0	$0	$0	$0	$0
1710030604	$0	$0	$0	$0	$0	$0

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001807	$0	$0	$0	$0	$0	$0
1711001808	$20,990	$20,990	$20,990	$20,990	$20,990	$20,990
1711001908	$0	$0	$0	$0	$0	$0
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$11,933	$11,933	$11,933	$11,933	$11,933	$11,933
1711002003	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0
N16	$0	$0	$0	$0	$0	$0
N17	$6,977	$6,977	$6,977	$6,977	$6,977	$6,977
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$27,881	$27,881	$27,881	$27,881	$27,881	$27,881
1707010513	$29,297	$29,297	$29,297	$29,297	$29,297	$29,297
1708000106	$35,290	$35,290	$35,290	$35,290	$35,290	$35,290
1708000107	$85,303	$85,303	$85,303	$85,303	$85,303	$85,303
1708000109	$179,114	$179,114	$179,114	$179,114	$179,114	$179,114
1708000205	$248,201	$248,201	$248,201	$248,201	$248,201	$248,201
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$20,946	$20,946	$20,946	$20,946	$20,946	$20,946
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$63,268	$63,268	$63,268	$63,268	$63,268	$63,268
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$107,539	$107,539	$107,539	$107,539	$107,539	$107,539
1708000508	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$19,054	$19,054	$19,054	$19,054	$19,054	$19,054
1708000603	$0	$0	$0	$0	$0	$0

Ozette Lake sockeye salmon ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$0	$0	$0	$0	$0	$0
1702000504	$0	$0	$0	$0	$0	$0
1702000505	$0	$0	$0	$0	$0	$0
1702000601	$0	$0	$0	$0	$0	$0
1702000602	$18,294	$18,294	$18,294	$18,294	$18,294	$18,294
1702000603	$0	$0	$0	$0	$0	$0
1702000604	$0	$0	$0	$0	$0	$0
1702000605	$0	$0	$0	$0	$0	$0
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$7,975	$7,975	$7,975	$7,975	$7,975	$7,975
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$23,912	$23,912	$23,912	$23,912	$23,912	$23,912
1702000807	$0	$0	$0	$0	$0	$0
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$71,927	$71,927	$71,927	$71,927	$71,927	$71,927
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$7,978	$7,978	$7,978	$7,978	$7,978	$7,978
1702001204	$7,977	$7,977	$7,977	$7,977	$7,977	$7,977
1702001509	$0	$0	$0	$0	$0	$0
1702001604	$6,974	$6,974	$6,974	$6,974	$6,974	$6,974
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$85,056	$85,056	$85,056	$85,056	$85,056	$85,056
1707010102	$7,040	$7,040	$7,040	$7,040	$7,040	$7,040
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010114	$20,730	$20,730	$20,730	$20,730	$20,730	$20,730
1707010501	$36,572	$36,572	$36,572	$36,572	$36,572	$36,572
1707010504	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010512	$27,881	$27,881	$27,881	$27,881	$27,881	$27,881
1707010513	$29,297	$29,297	$29,297	$29,297	$29,297	$29,297
1708000107	$85,303	$85,303	$85,303	$85,303	$85,303	$85,303

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$19,562	$19,562	$19,562	$19,562	$19,562	$19,562
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$0	$0	$0	$0	$0	$0
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$0	$0	$0	$0
1706010406	$18,220	$18,220	$18,220	$18,220	$18,220	$18,220

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$0	$0	$0	$0	$0	$0
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$0	$0	$0	$0	$0	$0
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$7,034	$7,034	$7,034	$7,034	$7,034	$7,034
1706010501	$0	$0	$0	$0	$0	$0
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$12,738	$12,738	$12,738	$12,738	$12,738	$12,738
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$0	$0	$0	$0	$0	$0
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$20,971	$20,971	$20,971	$20,971	$20,971	$20,971
1706010706	$0	$0	$0	$0	$0	$0
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$12,774	$12,774	$12,774	$12,774	$12,774	$12,774
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$0	$0	$0	$0	$0	$0
1706020104	$7,974	$7,974	$7,974	$7,974	$7,974	$7,974
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$0	$0	$0	$0	$0	$0
1706020113	$37,853	$37,853	$37,853	$37,853	$37,853	$37,853

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$8,042	$8,042	$8,042	$8,042	$8,042	$8,042
1706020117	$0	$0	$0	$0	$0	$0
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$0	$0	$0	$0	$0	$0
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$0	$0	$0	$0	$0	$0
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$0	$0	$0	$0	$0	$0
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$0	$0	$0	$0
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$0	$0	$0	$0	$0	$0
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$0	$0	$0	$0	$0	$0
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$0	$0
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$0	$0	$0	$0	$0	$0
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$12,179	$12,179	$12,179	$12,179	$12,179	$12,179
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$0	$0	$0	$0
1706020909	$7,027	$7,027	$7,027	$7,027	$7,027	$7,027
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$0	$0	$0	$0	$0	$0
1706020912	$33,411	$33,411	$33,411	$33,411	$33,411	$33,411
1706020913	$35,846	$35,846	$35,846	$35,846	$35,846	$35,846
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$31,710	$31,710	$31,710	$31,710	$31,710	$31,710
1706021002	$12,376	$12,376	$12,376	$12,376	$12,376	$12,376
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$6,982	$6,982	$6,982	$6,982	$6,982	$6,982
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$0	$0	$0	$0	$0	$0
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$6,976	$6,976	$6,976	$6,976	$6,976	$6,976
1706030601	$8,001	$8,001	$8,001	$8,001	$8,001	$8,001
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$0	$0	$0	$0	$0	$0
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$12,260	$12,260	$12,260	$12,260	$12,260	$12,260
1706030613	$12,143	$12,143	$12,143	$12,143	$12,143	$12,143
1706030614	$7,064	$7,064	$7,064	$7,064	$7,064	$7,064
1706030615	$7,971	$7,971	$7,971	$7,971	$7,971	$7,971
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$11,938	$11,938	$11,938	$11,938	$11,938	$11,938
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$12,197	$12,197	$12,197	$12,197	$12,197	$12,197
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$11,955	$11,955	$11,955	$11,955	$11,955	$11,955
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$85,056	$85,056	$85,056	$85,056	$85,056	$85,056
1707010102	$7,040	$7,040	$7,040	$7,040	$7,040	$7,040
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010114	$20,730	$20,730	$20,730	$20,730	$20,730	$20,730
1707010501	$36,572	$36,572	$36,572	$36,572	$36,572	$36,572
1707010504	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010512	$27,881	$27,881	$27,881	$27,881	$27,881	$27,881
1707010513	$29,297	$29,297	$29,297	$29,297	$29,297	$29,297
1708000107	$85,303	$85,303	$85,303	$85,303	$85,303	$85,303

Lower Columbia River O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$18,012	$18,012	$18,012	$18,012	$18,012	$18,012
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$24,443	$24,443	$24,443	$24,443	$24,443	$24,443
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$27,881	$27,881	$27,881	$27,881	$27,881	$27,881
1707010513	$29,297	$29,297	$29,297	$29,297	$29,297	$29,297
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$14,039	$14,039	$14,039	$14,039	$14,039	$14,039
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$25,650	$25,650	$25,650	$25,650	$25,650	$25,650
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$35,290	$35,290	$35,290	$35,290	$35,290	$35,290
1708000107	$85,303	$85,303	$85,303	$85,303	$85,303	$85,303
1708000108	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1708000109	$179,114	$179,114	$179,114	$179,114	$179,114	$179,114
1708000205	$248,201	$248,201	$248,201	$248,201	$248,201	$248,201
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$20,946	$20,946	$20,946	$20,946	$20,946	$20,946
1708000401	$12,111	$12,111	$12,111	$12,111	$12,111	$12,111
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$6,971	$6,971	$6,971	$6,971	$6,971	$6,971
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$23,917	$23,917	$23,917	$23,917	$23,917	$23,917
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$63,268	$63,268	$63,268	$63,268	$63,268	$63,268
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$107,539	$107,539	$107,539	$107,539	$107,539	$107,539
1708000508	$0	$0	$0	$0	$0	$0
1709000704	$61,035	$61,035	$61,035	$61,035	$61,035	$61,035
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$26,581	$26,581	$26,581	$26,581	$26,581	$26,581
1709001201	$70,874	$70,874	$70,874	$70,874	$70,874	$70,874
1709001202	$19,345	$19,345	$19,345	$19,345	$19,345	$19,345
1709001203	$220,630	$220,630	$220,630	$220,630	$220,630	$220,630

Upper Willamette O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$12,128	$12,128	$12,128	$12,128	$12,128	$12,128
1709000304	$13,009	$13,009	$13,009	$13,009	$13,009	$13,009
1709000306	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$37,007	$37,007	$37,007	$37,007	$37,007	$37,007
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1709000702	$18,967	$18,967	$18,967	$18,967	$18,967	$18,967
1709000703	$44,611	$44,611	$44,611	$44,611	$44,611	$44,611
1709000704	$61,035	$61,035	$61,035	$61,035	$61,035	$61,035
1709000801	$12,135	$12,135	$12,135	$12,135	$12,135	$12,135
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$7,050	$7,050	$7,050	$7,050	$7,050	$7,050
1709001001	$26,024	$26,024	$26,024	$26,024	$26,024	$26,024
1709001002	$14,106	$14,106	$14,106	$14,106	$14,106	$14,106
1709001003	$12,850	$12,850	$12,850	$12,850	$12,850	$12,850
1709001004	$76,583	$76,583	$76,583	$76,583	$76,583	$76,583
1709001005	$41,928	$41,928	$41,928	$41,928	$41,928	$41,928
1709001201	$70,874	$70,874	$70,874	$70,874	$70,874	$70,874
1709001203	$220,630	$220,630	$220,630	$220,630	$220,630	$220,630

Middle Columbia River O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1703000101	$12,197	$12,197	$12,197	$12,197	$12,197	$12,197
1703000102	$0	$0	$0	$0	$0	$0
1703000103	$12,382	$12,382	$12,382	$12,382	$12,382	$12,382
1703000104	$7,060	$7,060	$7,060	$7,060	$7,060	$7,060
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$124,137	$124,137	$124,137	$124,137	$124,137	$124,137
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$44,869	$44,869	$44,869	$44,869	$44,869	$44,869
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$30,950	$30,950	$30,950	$30,950	$30,950	$30,950
1703000305	$70,120	$70,120	$70,120	$70,120	$70,120	$70,120
1703000306	$0	$0	$0	$0	$0	$0
1703000307	$23,890	$23,890	$23,890	$23,890	$23,890	$23,890
1707010101	$85,056	$85,056	$85,056	$85,056	$85,056	$85,056
1707010102	$7,040	$7,040	$7,040	$7,040	$7,040	$7,040
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$0	$0	$0	$0	$0	$0
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$20,730	$20,730	$20,730	$20,730	$20,730	$20,730
1707010201	$18,032	$18,032	$18,032	$18,032	$18,032	$18,032
1707010202	$0	$0	$0	$0	$0	$0
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$15,030	$15,030	$15,030	$15,030	$15,030	$15,030
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$12,135	$12,135	$12,135	$12,135	$12,135	$12,135
1707010209	$17,959	$17,959	$17,959	$17,959	$17,959	$17,959
1707010210	$0	$0	$0	$0	$0	$0
1707010211	$20,914	$20,914	$20,914	$20,914	$20,914	$20,914
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$0	$0	$0	$0	$0	$0
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$12,008	$12,008	$12,008	$12,008	$12,008	$12,008
1707010306	$12,868	$12,868	$12,868	$12,868	$12,868	$12,868

Middle Columbia River O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$19,984	$19,984	$19,984	$19,984	$19,984	$19,984
1707010310	$17,996	$17,996	$17,996	$17,996	$17,996	$17,996
1707010313	$31,425	$31,425	$31,425	$31,425	$31,425	$31,425
1707010501	$36,572	$36,572	$36,572	$36,572	$36,572	$36,572
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$0	$0	$0	$0	$0	$0
1707010504	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707010505	$0	$0	$0	$0	$0	$0
1707010512	$27,881	$27,881	$27,881	$27,881	$27,881	$27,881
1707010513	$29,297	$29,297	$29,297	$29,297	$29,297	$29,297
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$0	$0	$0	$0	$0	$0
1707010603	$0	$0	$0	$0	$0	$0
1707010604	$0	$0	$0	$0	$0	$0
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$12,739	$12,739	$12,739	$12,739	$12,739	$12,739
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$0	$0	$0	$0	$0	$0
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Transportation Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$0	$0	$0	$0	$0	$0
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$6,970	$6,970	$6,970	$6,970	$6,970	$6,970
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$13,940	$13,940	$13,940	$13,940	$13,940	$13,940
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$0	$0	$0	$0	$0	$0
1707020412	$12,051	$12,051	$12,051	$12,051	$12,051	$12,051
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$7,072	$7,072	$7,072	$7,072	$7,072	$7,072
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$12,292	$12,292	$12,292	$12,292	$12,292	$12,292
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$0	$0	$0	$0
1707030611	$0	$0	$0	$0	$0	$0
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$18,297	$18,297	$18,297	$18,297	$18,297	$18,297
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$85,303	$85,303	$85,303	$85,303	$85,303	$85,303

Appendix F.7
Annual Utility Project Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1711000202	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
1711000204	$100,000	$100,000	$101,000	$101,000	$102,000	$102,000
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$0	$0	$0	$0
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711000405	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$0	$0	$0	$0	$0	$0
1711000506	$0	$0	$0	$0	$0	$0
1711000507	$0	$0	$0	$0	$0	$0
1711000508	$0	$0	$0	$0	$0	$0
1711000601	$0	$0	$0	$0	$0	$0
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$0	$0	$0	$0
1711000604	$0	$0	$0	$0	$0	$0
1711000701	$0	$0	$0	$0	$0	$0
1711000702	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1711000801	$0	$0	$0	$0	$0	$0
1711000802	$0	$0	$0	$0	$0	$0
1711000803	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$0	$0	$0	$0	$0	$0
1711000903	$0	$0	$0	$0	$0	$0
1711000904	$0	$0	$0	$0	$0	$0
1711000905	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001003	$0	$0	$0	$0	$0	$0
1711001004	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001101	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1711001102	$150,000	$150,000	$151,500	$151,500	$153,000	$153,000
1711001201	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001202	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001203	$325,000	$325,000	$328,250	$328,250	$331,500	$331,500
1711001204	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001303	$150,000	$150,000	$151,500	$151,500	$153,000	$153,000
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
1711001403	$0	$0	$0	$0	$0	$0
1711001404	$0	$0	$0	$0	$0	$0
1711001405	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001502	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001503	$0	$0	$0	$0	$0	$0
1711001601	$0	$0	$0	$0	$0	$0
1711001602	$0	$0	$0	$0	$0	$0
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001808	$0	$0	$0	$0	$0	$0
1711001900	$0	$0	$0	$0	$0	$0
1711001901	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711001902	$0	$0	$0	$0	$0	$0
1711001904	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1711002003	$0	$0	$0	$0	$0	$0
1711002004	$0	$0	$0	$0	$0	$0
1711002007	$0	$0	$0	$0	$0	$0
N01	$0	$0	$0	$0	$0	$0
N02	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
N03	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
N04	$0	$0	$0	$0	$0	$0
N05	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
N06	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
N07	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
N08	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
N09	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
N13	$0	$0	$0	$0	$0	$0
N14	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
N15	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
N19	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500

Lower Columbia River chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$100,000	$100,000	$101,000	$101,000	$102,000	$102,000
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1708000302	$0	$0	$0	$0	$0	$0
1708000303	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
1708000601	$0	$0	$0	$0	$0	$0
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0
1709000704	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709001202	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1709001203	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085

Upper Willamette River chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$0	$0	$0	$0
1709000201	$0	$0	$0	$0	$0	$0
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$0	$0	$0	$0	$0	$0
1709000205	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000301	$0	$0	$0	$0	$0	$0
1709000302	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085
1709000303	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$100,125	$100,125	$101,126	$101,126	$102,128	$102,128
1709000305	$100,125	$100,125	$101,126	$101,126	$102,128	$102,128
1709000306	$0	$0	$0	$0	$0	$0
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000704	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043

Upper Willamette River chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1702001003	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001004	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001104	$0	$0	$0	$0	$0	$0
1702001105	$0	$0	$0	$0	$0	$0
1702001604	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010504	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$0	$0	$0	$0	$0	$0
1710020201	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1710020202	$0	$0	$0	$0	$0	$0
1710020203	$0	$0	$0	$0	$0	$0
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$0	$0	$0	$0
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$0	$0	$0	$0	$0	$0
1710020303	$0	$0	$0	$0	$0	$0
1710020304	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1710020305	$0	$0	$0	$0	$0	$0
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$0	$0	$0	$0	$0	$0
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$0	$0	$0	$0	$0	$0
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$0	$0	$0	$0	$0	$0
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$0	$0	$0	$0	$0	$0
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$0	$0	$0	$0	$0	$0
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$0	$0	$0	$0	$0	$0
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$0	$0	$0	$0	$0	$0
1710030112	$0	$0	$0	$0	$0	$0
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$0	$0	$0	$0	$0	$0
1710030207	$0	$0	$0	$0	$0	$0
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$0	$0	$0	$0
1710030210	$0	$0	$0	$0	$0	$0
1710030211	$0	$0	$0	$0	$0	$0
1710030212	$0	$0	$0	$0	$0	$0
1710030213	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$0	$0	$0	$0	$0	$0
1710030303	$0	$0	$0	$0	$0	$0
1710030304	$0	$0	$0	$0	$0	$0
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$0	$0	$0	$0	$0	$0
1710030308	$0	$0	$0	$0	$0	$0
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$0	$0	$0	$0
1710030404	$0	$0	$0	$0	$0	$0
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$0	$0	$0	$0	$0	$0
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$0	$0	$0	$0	$0	$0
1710030506	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1710030603	$0	$0	$0	$0	$0	$0
1710030604	$0	$0	$0	$0	$0	$0

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001807	$0	$0	$0	$0	$0	$0
1711001808	$0	$0	$0	$0	$0	$0
1711001908	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
N19	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500

Columbia River chum salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000109	$100,000	$100,000	$101,000	$101,000	$102,000	$102,000
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500

Columbia River chum salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0

Ozette Lake sockeye salmon ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$0	$0	$0	$0	$0	$0
1702000504	$0	$0	$0	$0	$0	$0
1702000505	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702000601	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702000602	$0	$0	$0	$0	$0	$0
1702000603	$0	$0	$0	$0	$0	$0
1702000604	$0	$0	$0	$0	$0	$0
1702000605	$0	$0	$0	$0	$0	$0
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1702001003	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001004	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001104	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$0	$0	$0	$0	$0	$0
1702001204	$0	$0	$0	$0	$0	$0
1702001509	$0	$0	$0	$0	$0	$0
1702001604	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010504	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$0	$0	$0	$0	$0	$0
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$0	$0	$0	$0
1706010406	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$0	$0	$0	$0	$0	$0
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$0	$0	$0	$0	$0	$0
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1706010501	$0	$0	$0	$0	$0	$0
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$0	$0	$0	$0	$0	$0
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$0	$0	$0	$0	$0	$0
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$40,000	$40,000	$40,400	$40,400	$40,800	$40,800
1706020104	$0	$0	$0	$0	$0	$0
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$0	$0	$0	$0	$0	$0
1706020113	$140,000	$140,000	$141,400	$141,400	$142,800	$142,800

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$60,000	$60,000	$60,600	$60,600	$61,200	$61,200
1706020117	$0	$0	$0	$0	$0	$0
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$0	$0	$0	$0	$0	$0
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$0	$0	$0	$0	$0	$0
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$60,000	$60,000	$60,600	$60,600	$61,200	$61,200
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$0	$0	$0	$0	$0	$0
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$0	$0	$0	$0	$0	$0
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$0	$0	$0	$0
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$0	$0	$0	$0	$0	$0
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$0	$0	$0	$0	$0	$0
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$0	$0
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$0	$0	$0	$0	$0	$0
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$0	$0	$0	$0
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$0	$0	$0	$0	$0	$0
1706020912	$0	$0	$0	$0	$0	$0
1706020913	$0	$0	$0	$0	$0	$0
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$0	$0	$0	$0	$0	$0
1706021002	$0	$0	$0	$0	$0	$0
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$0	$0	$0	$0	$0	$0
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$0	$0	$0	$0	$0	$0
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$0	$0	$0	$0	$0	$0
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$0	$0	$0	$0	$0	$0
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$0	$0	$0	$0	$0	$0
1706030613	$0	$0	$0	$0	$0	$0
1706030614	$0	$0	$0	$0	$0	$0
1706030615	$0	$0	$0	$0	$0	$0
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$0	$0	$0	$0	$0	$0
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$0	$0	$0	$0	$0	$0
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010504	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$100,000	$100,000	$101,000	$101,000	$102,000	$102,000
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$75,000	$75,000	$75,750	$75,750	$76,500	$76,500
1709000704	$0	$0	$0	$0	$0	$0
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709001202	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1709001203	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085

Upper Willamette O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$0	$0	$0	$0	$0	$0
1709000304	$100,125	$100,125	$101,126	$101,126	$102,128	$102,128
1709000306	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000704	$0	$0	$0	$0	$0	$0
1709000801	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001001	$0	$0	$0	$0	$0	$0
1709001002	$0	$0	$0	$0	$0	$0
1709001003	$0	$0	$0	$0	$0	$0
1709001004	$0	$0	$0	$0	$0	$0
1709001005	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085
1709001201	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1709001203	$66,750	$66,750	$67,418	$67,418	$68,085	$68,085

Middle Columbia River O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1703000101	$0	$0	$0	$0	$0	$0
1703000102	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1703000103	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1703000104	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$0	$0	$0	$0	$0	$0
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$0	$0	$0	$0	$0	$0
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1703000307	$0	$0	$0	$0	$0	$0
1707010101	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1707010102	$0	$0	$0	$0	$0	$0
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$50,000	$50,000	$50,500	$50,500	$51,000	$51,000
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$0	$0	$0	$0	$0	$0
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$0	$0	$0	$0	$0	$0
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$0	$0	$0	$0	$0	$0
1707010209	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010210	$0	$0	$0	$0	$0	$0
1707010211	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010304	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010501	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$0	$0	$0	$0	$0	$0
1707010504	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707010505	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$0	$0	$0	$0	$0	$0
1707010603	$25,000	$25,000	$25,250	$25,250	$25,500	$25,500
1707010604	$0	$0	$0	$0	$0	$0
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$0	$0	$0	$0
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$0	$0	$0	$0	$0	$0
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$33,375	$33,375	$33,709	$33,709	$34,043	$34,043
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Utility Line Project Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$0	$0	$0	$0	$0	$0
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$60,000	$60,000	$60,600	$60,600	$61,200	$61,200
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$0	$0	$0	$0	$0	$0
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$0	$0	$0	$0
1707030611	$0	$0	$0	$0	$0	$0
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Appendix F.8
Annual Instream Activity Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$243,750	$243,750	$531,375	$531,375	$819,000	$819,000
1711000202	$150,000	$150,000	$327,000	$327,000	$504,000	$504,000
1711000204	$143,750	$143,750	$313,375	$313,375	$483,000	$483,000
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$0	$0	$0	$0
1711000403	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1711000404	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1711000405	$193,750	$193,750	$422,375	$422,375	$651,000	$651,000
1711000504	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1711000505	$0	$0	$0	$0	$0	$0
1711000506	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1711000507	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1711000508	$0	$0	$0	$0	$0	$0
1711000601	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$0	$0	$0	$0
1711000604	$0	$0	$0	$0	$0	$0
1711000701	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1711000702	$131,250	$131,250	$286,125	$286,125	$441,000	$441,000
1711000801	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1711000802	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1711000803	$137,500	$137,500	$299,750	$299,750	$462,000	$462,000
1711000901	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1711000902	$0	$0	$0	$0	$0	$0
1711000903	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1711000904	$0	$0	$0	$0	$0	$0
1711000905	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1711001003	$75,000	$75,000	$163,500	$163,500	$252,000	$252,000
1711001004	$75,000	$75,000	$163,500	$163,500	$252,000	$252,000
1711001101	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1711001102	$268,750	$268,750	$585,875	$585,875	$903,000	$903,000
1711001201	$250,000	$250,000	$545,000	$545,000	$840,000	$840,000
1711001202	$825,000	$825,000	$1,798,500	$1,798,500	$2,772,000	$2,772,000
1711001203	$5,918,750	$5,918,750	$12,902,875	$12,902,875	$19,887,000	$19,887,000
1711001204	$487,500	$487,500	$1,062,750	$1,062,750	$1,638,000	$1,638,000
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1711001303	$618,750	$618,750	$1,348,875	$1,348,875	$2,079,000	$2,079,000
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$231,250	$231,250	$504,125	$504,125	$777,000	$777,000
1711001403	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1711001404	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1711001405	$137,500	$137,500	$299,750	$299,750	$462,000	$462,000
1711001502	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1711001503	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1711001601	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1711001602	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1711001701	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1711001802	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001808	$93,750	$93,750	$204,375	$204,375	$315,000	$315,000
1711001900	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000
1711001901	$325,000	$325,000	$708,500	$708,500	$1,092,000	$1,092,000
1711001902	$112,500	$112,500	$245,250	$245,250	$378,000	$378,000
1711001904	$343,750	$343,750	$749,375	$749,375	$1,155,000	$1,155,000
1711002003	$0	$0	$0	$0	$0	$0
1711002004	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1711002007	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
N01	$325,000	$325,000	$708,500	$708,500	$1,092,000	$1,092,000
N02	$706,250	$706,250	$1,539,625	$1,539,625	$2,373,000	$2,373,000
N03	$437,500	$437,500	$953,750	$953,750	$1,470,000	$1,470,000
N04	$0	$0	$0	$0	$0	$0
N05	$156,250	$156,250	$340,625	$340,625	$525,000	$525,000
N06	$268,750	$268,750	$585,875	$585,875	$903,000	$903,000
N07	$225,000	$225,000	$490,500	$490,500	$756,000	$756,000
N08	$425,000	$425,000	$926,500	$926,500	$1,428,000	$1,428,000
N09	$431,250	$431,250	$940,125	$940,125	$1,449,000	$1,449,000
N10	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
N11	$112,500	$112,500	$245,250	$245,250	$378,000	$378,000
N12	$143,750	$143,750	$313,375	$313,375	$483,000	$483,000
N13	$112,500	$112,500	$245,250	$245,250	$378,000	$378,000
N14	$1,300,000	$1,300,000	$2,834,000	$2,834,000	$4,368,000	$4,368,000
N15	$143,750	$143,750	$313,375	$313,375	$483,000	$483,000

Puget Sound chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$156,250	$156,250	$340,625	$340,625	$525,000	$525,000
N17	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
N18	$462,500	$462,500	$1,008,250	$1,008,250	$1,554,000	$1,554,000
N19	$275,000	$275,000	$599,500	$599,500	$924,000	$924,000

Lower Columbia River chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$81,250	$81,250	$177,125	$177,125	$273,000	$273,000
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1708000107	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$831,250	$831,250	$1,812,125	$1,812,125	$2,793,000	$2,793,000
1708000205	$118,750	$118,750	$258,875	$258,875	$399,000	$399,000
1708000206	$75,000	$75,000	$163,500	$163,500	$252,000	$252,000
1708000301	$187,500	$187,500	$408,750	$408,750	$630,000	$630,000
1708000302	$0	$0	$0	$0	$0	$0
1708000303	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1708000304	$656,250	$656,250	$1,430,625	$1,430,625	$2,205,000	$2,205,000
1708000305	$112,500	$112,500	$245,250	$245,250	$378,000	$378,000
1708000306	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1708000403	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000

Lower Columbia River chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$62,500	$62,500	$136,250	$136,250	$210,000	$210,000
1708000508	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1708000601	$0	$0	$0	$0	$0	$0
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1709000704	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$0	$0	$0	$0	$0	$0
1709001202	$56,250	$56,250	$122,625	$122,625	$189,000	$189,000
1709001203	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035

Upper Willamette River chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$0	$0	$0	$0
1709000201	$0	$0	$0	$0	$0	$0
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$0	$0	$0	$0	$0	$0
1709000205	$0	$0	$0	$0	$0	$0
1709000301	$0	$0	$0	$0	$0	$0
1709000302	$0	$0	$0	$0	$0	$0
1709000303	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$0	$0	$0	$0	$0	$0
1709000305	$0	$0	$0	$0	$0	$0
1709000306	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$0	$0	$0	$0
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000704	$0	$0	$0	$0	$0	$0
1709000804	$16,688	$16,688	$36,379	$36,379	$56,070	$56,070
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$81,250	$81,250	$177,125	$177,125	$273,000	$273,000
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702000805	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1702000806	$131,250	$131,250	$286,125	$286,125	$441,000	$441,000
1702000807	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1702001001	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702001002	$712,500	$712,500	$1,553,250	$1,553,250	$2,394,000	$2,394,000
1702001003	$81,250	$81,250	$177,125	$177,125	$273,000	$273,000
1702001004	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1702001101	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702001104	$162,500	$162,500	$354,250	$354,250	$546,000	$546,000
1702001105	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1702001604	$50,000	$50,000	$109,000	$109,000	$168,000	$168,000
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$125,000	$125,000	$272,500	$272,500	$420,000	$420,000
1707010101	$131,250	$131,250	$286,125	$286,125	$441,000	$441,000
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010504	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000

Oregon Coast coho salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$0	$0	$0	$0	$0	$0
1710020201	$0	$0	$0	$0	$0	$0
1710020202	$0	$0	$0	$0	$0	$0
1710020203	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$0	$0	$0	$0
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1710020303	$0	$0	$0	$0	$0	$0
1710020304	$0	$0	$0	$0	$0	$0
1710020305	$0	$0	$0	$0	$0	$0
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1710020308	$0	$0	$0	$0	$0	$0
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$0	$0	$0	$0	$0	$0
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$0	$0	$0	$0	$0	$0
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$0	$0	$0	$0	$0	$0
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$0	$0	$0	$0	$0	$0
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$0	$0	$0	$0	$0	$0
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035

Oregon Coast coho salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$0	$0	$0	$0	$0	$0
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$0	$0	$0	$0	$0	$0
1710030112	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$0	$0	$0	$0	$0	$0
1710030207	$0	$0	$0	$0	$0	$0
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$0	$0	$0	$0
1710030210	$0	$0	$0	$0	$0	$0
1710030211	$0	$0	$0	$0	$0	$0
1710030212	$0	$0	$0	$0	$0	$0
1710030213	$0	$0	$0	$0	$0	$0
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$0	$0	$0	$0	$0	$0
1710030303	$0	$0	$0	$0	$0	$0
1710030304	$0	$0	$0	$0	$0	$0
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1710030308	$0	$0	$0	$0	$0	$0
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$0	$0	$0	$0
1710030404	$25,031	$25,031	$54,568	$54,568	$84,105	$84,105
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$0	$0	$0	$0	$0	$0
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1710030506	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1710030603	$0	$0	$0	$0	$0	$0
1710030604	$0	$0	$0	$0	$0	$0

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1711001802	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001807	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1711001808	$93,750	$93,750	$204,375	$204,375	$315,000	$315,000
1711001908	$162,500	$162,500	$354,250	$354,250	$546,000	$546,000
1711002001	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1711002002	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1711002003	$0	$0	$0	$0	$0	$0
N15	$143,750	$143,750	$313,375	$313,375	$483,000	$483,000
N16	$156,250	$156,250	$340,625	$340,625	$525,000	$525,000
N17	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
N18	$462,500	$462,500	$1,008,250	$1,008,250	$1,554,000	$1,554,000
N19	$275,000	$275,000	$599,500	$599,500	$924,000	$924,000

Columbia River chum salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000106	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1708000107	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000
1708000109	$831,250	$831,250	$1,812,125	$1,812,125	$2,793,000	$2,793,000
1708000205	$118,750	$118,750	$258,875	$258,875	$399,000	$399,000
1708000206	$75,000	$75,000	$163,500	$163,500	$252,000	$252,000
1708000301	$187,500	$187,500	$408,750	$408,750	$630,000	$630,000
1708000304	$656,250	$656,250	$1,430,625	$1,430,625	$2,205,000	$2,205,000
1708000305	$112,500	$112,500	$245,250	$245,250	$378,000	$378,000
1708000503	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$62,500	$62,500	$136,250	$136,250	$210,000	$210,000
1708000508	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000

Columbia River chum salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000

Ozette Lake sockeye salmon ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1702000504	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702000505	$81,250	$81,250	$177,125	$177,125	$273,000	$273,000
1702000601	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1702000602	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702000603	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702000604	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1702000605	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702000805	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1702000806	$131,250	$131,250	$286,125	$286,125	$441,000	$441,000
1702000807	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702001002	$712,500	$712,500	$1,553,250	$1,553,250	$2,394,000	$2,394,000
1702001003	$81,250	$81,250	$177,125	$177,125	$273,000	$273,000
1702001004	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1702001101	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702001104	$162,500	$162,500	$354,250	$354,250	$546,000	$546,000

Upper Columbia River O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1702001204	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1702001509	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1702001604	$50,000	$50,000	$109,000	$109,000	$168,000	$168,000
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$125,000	$125,000	$272,500	$272,500	$420,000	$420,000
1707010101	$131,250	$131,250	$286,125	$286,125	$441,000	$441,000
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010504	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$125,000	$125,000	$272,500	$272,500	$420,000	$420,000
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$75,000	$75,000	$163,500	$163,500	$252,000	$252,000
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$0	$0	$0	$0
1706010406	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$0	$0	$0	$0	$0	$0
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$0	$0	$0	$0	$0	$0
1706010501	$0	$0	$0	$0	$0	$0
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$93,750	$93,750	$204,375	$204,375	$315,000	$315,000
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$0	$0	$0	$0	$0	$0
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1706011003	$56,250	$56,250	$122,625	$122,625	$189,000	$189,000
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$70,000	$70,000	$152,600	$152,600	$235,200	$235,200
1706020104	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706020105	$105,000	$105,000	$228,900	$228,900	$352,800	$352,800
1706020107	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706020108	$40,000	$40,000	$87,200	$87,200	$134,400	$134,400
1706020109	$50,000	$50,000	$109,000	$109,000	$168,000	$168,000
1706020110	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706020113	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$45,000	$45,000	$98,100	$98,100	$151,200	$151,200
1706020117	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1706020118	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800
1706020119	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706020120	$45,000	$45,000	$98,100	$98,100	$151,200	$151,200
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$20,000	$20,000	$43,600	$43,600	$67,200	$67,200
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020125	$20,000	$20,000	$43,600	$43,600	$67,200	$67,200
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$40,000	$40,000	$87,200	$87,200	$134,400	$134,400
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020201	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$60,000	$60,000	$130,800	$130,800	$201,600	$201,600
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$0	$0	$0	$0	$0	$0
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$0	$0	$0	$0	$0	$0
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$0	$0	$0	$0
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$35,000	$35,000	$76,300	$76,300	$117,600	$117,600
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$0	$0	$0	$0	$0	$0
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$20,000	$20,000	$43,600	$43,600	$67,200	$67,200
1706020701	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$0	$0
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020808	$35,000	$35,000	$76,300	$76,300	$117,600	$117,600
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1706020908	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706020912	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800
1706020913	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$90,000	$90,000	$196,200	$196,200	$302,400	$302,400
1706021002	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1706030304	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1706030308	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706030502	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$20,000	$20,000	$43,600	$43,600	$67,200	$67,200
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$20,000	$20,000	$43,600	$43,600	$67,200	$67,200
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$85,000	$85,000	$185,300	$185,300	$285,600	$285,600
1706030602	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706030603	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706030607	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706030608	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706030609	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800
1706030610	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800
1706030611	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$35,000	$35,000	$76,300	$76,300	$117,600	$117,600
1706030613	$0	$0	$0	$0	$0	$0
1706030614	$30,000	$30,000	$65,400	$65,400	$100,800	$100,800
1706030615	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706030618	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$35,000	$35,000	$76,300	$76,300	$117,600	$117,600
1706030621	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1706030622	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1706030623	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1706030631	$15,000	$15,000	$32,700	$32,700	$50,400	$50,400
1706030801	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1707010101	$131,250	$131,250	$286,125	$286,125	$441,000	$441,000
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010504	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000

Lower Columbia River O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1708000107	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$831,250	$831,250	$1,812,125	$1,812,125	$2,793,000	$2,793,000
1708000205	$118,750	$118,750	$258,875	$258,875	$399,000	$399,000
1708000206	$75,000	$75,000	$163,500	$163,500	$252,000	$252,000
1708000301	$187,500	$187,500	$408,750	$408,750	$630,000	$630,000
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1708000403	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1708000501	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$68,750	$68,750	$149,875	$149,875	$231,000	$231,000
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$62,500	$62,500	$136,250	$136,250	$210,000	$210,000
1708000508	$37,500	$37,500	$81,750	$81,750	$126,000	$126,000
1709000704	$0	$0	$0	$0	$0	$0
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$0	$0	$0	$0	$0	$0
1709001202	$56,250	$56,250	$122,625	$122,625	$189,000	$189,000
1709001203	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035

Upper Willamette O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$0	$0	$0	$0	$0	$0
1709000304	$0	$0	$0	$0	$0	$0
1709000306	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$0	$0	$0	$0
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000704	$0	$0	$0	$0	$0	$0
1709000801	$0	$0	$0	$0	$0	$0
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$16,688	$16,688	$36,379	$36,379	$56,070	$56,070
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001001	$0	$0	$0	$0	$0	$0
1709001002	$0	$0	$0	$0	$0	$0
1709001003	$0	$0	$0	$0	$0	$0
1709001004	$0	$0	$0	$0	$0	$0
1709001005	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1709001201	$0	$0	$0	$0	$0	$0
1709001203	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035

Middle Columbia River O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$125,000	$125,000	$272,500	$272,500	$420,000	$420,000
1703000101	$93,750	$93,750	$204,375	$204,375	$315,000	$315,000
1703000102	$43,750	$43,750	$95,375	$95,375	$147,000	$147,000
1703000103	$256,250	$256,250	$558,625	$558,625	$861,000	$861,000
1703000104	$93,750	$93,750	$204,375	$204,375	$315,000	$315,000
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$93,750	$93,750	$204,375	$204,375	$315,000	$315,000
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1703000303	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1703000304	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1703000307	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1707010101	$131,250	$131,250	$286,125	$286,125	$441,000	$441,000
1707010102	$0	$0	$0	$0	$0	$0
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1707010203	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1707010204	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$18,750	$18,750	$40,875	$40,875	$63,000	$63,000
1707010209	$0	$0	$0	$0	$0	$0
1707010210	$6,250	$6,250	$13,625	$13,625	$21,000	$21,000
1707010211	$25,000	$25,000	$54,500	$54,500	$84,000	$84,000
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$16,688	$16,688	$36,379	$36,379	$56,070	$56,070
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$0	$0	$0	$0	$0	$0
1707010501	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010502	$16,688	$16,688	$36,379	$36,379	$56,070	$56,070
1707010503	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1707010504	$31,250	$31,250	$68,125	$68,125	$105,000	$105,000
1707010505	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$0	$0	$0	$0	$0	$0
1707010603	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1707010604	$12,500	$12,500	$27,250	$27,250	$42,000	$42,000
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$0	$0	$0	$0
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$0	$0	$0	$0	$0	$0
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$5,000	$5,000	$10,900	$10,900	$16,800	$16,800
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Instream Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$8,344	$8,344	$18,189	$18,189	$28,035	$28,035
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$10,000	$10,000	$21,800	$21,800	$33,600	$33,600
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$130,000	$130,000	$283,400	$283,400	$436,800	$436,800
1707020412	$50,000	$50,000	$109,000	$109,000	$168,000	$168,000
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$0	$0	$0	$0	$0	$0
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$0	$0	$0	$0
1707030611	$0	$0	$0	$0	$0	$0
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$218,750	$218,750	$476,875	$476,875	$735,000	$735,000

Appendix F.9
Annual Dredging Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$0	$0	$0	$0	$0	$0
1711000202	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711000204	$0	$0	$0	$0	$0	$0
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$0	$0	$0	$0
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$0	$0	$0	$0	$0	$0
1711000405	$0	$0	$0	$0	$0	$0
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$0	$0	$0	$0	$0	$0
1711000506	$0	$0	$0	$0	$0	$0
1711000507	$0	$0	$0	$0	$0	$0
1711000508	$0	$0	$0	$0	$0	$0
1711000601	$0	$0	$0	$0	$0	$0
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$0	$0	$0	$0
1711000604	$0	$0	$0	$0	$0	$0
1711000701	$0	$0	$0	$0	$0	$0
1711000702	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711000801	$0	$0	$0	$0	$0	$0
1711000802	$0	$0	$0	$0	$0	$0
1711000803	$0	$0	$0	$0	$0	$0
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$0	$0	$0	$0	$0	$0
1711000903	$0	$0	$0	$0	$0	$0
1711000904	$0	$0	$0	$0	$0	$0
1711000905	$0	$0	$0	$0	$0	$0
1711001003	$0	$0	$0	$0	$0	$0
1711001004	$0	$0	$0	$0	$0	$0
1711001101	$0	$0	$0	$0	$0	$0
1711001102	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
1711001201	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711001202	$0	$0	$0	$0	$0	$0
1711001203	$664,000	$664,000	$1,642,000	$1,642,000	$2,620,000	$2,620,000
1711001204	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$0	$0	$0	$0	$0	$0
1711001303	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
1711001403	$0	$0	$0	$0	$0	$0
1711001404	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711001405	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1711001502	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711001503	$0	$0	$0	$0	$0	$0
1711001601	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711001602	$0	$0	$0	$0	$0	$0
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001808	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711001900	$0	$0	$0	$0	$0	$0
1711001901	$498,000	$498,000	$1,231,500	$1,231,500	$1,965,000	$1,965,000
1711001902	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711001904	$332,000	$332,000	$821,000	$821,000	$1,310,000	$1,310,000
1711002003	$0	$0	$0	$0	$0	$0
1711002004	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711002007	$0	$0	$0	$0	$0	$0
N01	$332,000	$332,000	$821,000	$821,000	$1,310,000	$1,310,000
N02	$0	$0	$0	$0	$0	$0
N03	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
N04	$0	$0	$0	$0	$0	$0
N05	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
N06	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
N07	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
N08	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
N09	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
N13	$0	$0	$0	$0	$0	$0
N14	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
N15	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000

Puget Sound chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
N19	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500

Lower Columbia River chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$664,000	$664,000	$1,642,000	$1,642,000	$2,620,000	$2,620,000
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1708000301	$0	$0	$0	$0	$0	$0
1708000302	$0	$0	$0	$0	$0	$0
1708000303	$0	$0	$0	$0	$0	$0
1708000304	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1708000601	$221,610	$221,610	$548,018	$548,018	$874,425	$874,425
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0
1709000704	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1709001202	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1709001203	$997,245	$997,245	$2,466,079	$2,466,079	$3,934,913	$3,934,913

Upper Willamette River chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$0	$0	$0	$0
1709000201	$0	$0	$0	$0	$0	$0
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$0	$0	$0	$0	$0	$0
1709000205	$0	$0	$0	$0	$0	$0
1709000301	$0	$0	$0	$0	$0	$0
1709000302	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1709000303	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$0	$0	$0	$0	$0	$0
1709000305	$0	$0	$0	$0	$0	$0
1709000306	$0	$0	$0	$0	$0	$0
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$221,610	$221,610	$548,018	$548,018	$874,425	$874,425
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$0	$0	$0	$0
1709000704	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$221,610	$221,610	$548,018	$548,018	$874,425	$874,425
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213

Upper Willamette River chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$997,245	$997,245	$2,466,079	$2,466,079	$3,934,913	$3,934,913

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1702001105	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1707010501	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$0	$0	$0	$0	$0	$0
1710020201	$0	$0	$0	$0	$0	$0
1710020202	$0	$0	$0	$0	$0	$0
1710020203	$0	$0	$0	$0	$0	$0
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$0	$0	$0	$0
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$0	$0	$0	$0	$0	$0
1710020303	$0	$0	$0	$0	$0	$0
1710020304	$0	$0	$0	$0	$0	$0
1710020305	$0	$0	$0	$0	$0	$0
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$0	$0	$0	$0	$0	$0
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$0	$0	$0	$0	$0	$0
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$0	$0	$0	$0	$0	$0
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$0	$0	$0	$0	$0	$0
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$0	$0	$0	$0	$0	$0
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$0	$0	$0	$0	$0	$0
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$0	$0	$0	$0	$0	$0
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$0	$0	$0	$0	$0	$0
1710030112	$0	$0	$0	$0	$0	$0
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$0	$0	$0	$0	$0	$0
1710030207	$0	$0	$0	$0	$0	$0
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$0	$0	$0	$0
1710030210	$0	$0	$0	$0	$0	$0
1710030211	$0	$0	$0	$0	$0	$0
1710030212	$0	$0	$0	$0	$0	$0
1710030213	$0	$0	$0	$0	$0	$0
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$0	$0	$0	$0	$0	$0
1710030303	$0	$0	$0	$0	$0	$0
1710030304	$0	$0	$0	$0	$0	$0
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$0	$0	$0	$0	$0	$0
1710030308	$0	$0	$0	$0	$0	$0
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$0	$0	$0	$0
1710030404	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$0	$0	$0	$0	$0	$0
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$0	$0	$0	$0	$0	$0
1710030506	$0	$0	$0	$0	$0	$0
1710030603	$0	$0	$0	$0	$0	$0
1710030604	$0	$0	$0	$0	$0	$0

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001807	$0	$0	$0	$0	$0	$0
1711001808	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711001908	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$0	$0	$0	$0
N15	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
N19	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500

Columbia River chum salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000109	$664,000	$664,000	$1,642,000	$1,642,000	$2,620,000	$2,620,000
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1708000301	$0	$0	$0	$0	$0	$0
1708000304	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500

Columbia River chum salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$0	$0	$0	$0	$0	$0
1708000603	$0	$0	$0	$0	$0	$0

Ozette Lake sockeye salmon ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$0	$0	$0	$0	$0	$0
1702000504	$0	$0	$0	$0	$0	$0
1702000505	$0	$0	$0	$0	$0	$0
1702000601	$0	$0	$0	$0	$0	$0
1702000602	$0	$0	$0	$0	$0	$0
1702000603	$0	$0	$0	$0	$0	$0
1702000604	$0	$0	$0	$0	$0	$0
1702000605	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$0	$0	$0	$0	$0	$0
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500

Upper Columbia River O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$0	$0	$0	$0	$0	$0
1702001204	$0	$0	$0	$0	$0	$0
1702001509	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1707010501	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$265,600	$265,600	$656,800	$656,800	$1,048,000	$1,048,000
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$398,400	$398,400	$985,200	$985,200	$1,572,000	$1,572,000
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$0	$0	$0	$0
1706010406	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$0	$0	$0	$0	$0	$0
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$0	$0	$0	$0	$0	$0
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$0	$0	$0	$0	$0	$0
1706010501	$0	$0	$0	$0	$0	$0
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$0	$0	$0	$0	$0	$0
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$0	$0	$0	$0	$0	$0
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$0	$0	$0	$0	$0	$0
1706020104	$0	$0	$0	$0	$0	$0
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$0	$0	$0	$0	$0	$0
1706020113	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$199,200	$199,200	$492,600	$492,600	$786,000	$786,000
1706020115	$0	$0	$0	$0	$0	$0
1706020117	$0	$0	$0	$0	$0	$0
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$0	$0	$0	$0	$0	$0
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$0	$0	$0	$0	$0	$0
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$0	$0	$0	$0	$0	$0
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$0	$0	$0	$0	$0	$0
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$0	$0	$0	$0
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$0	$0	$0	$0	$0	$0
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$0	$0	$0	$0	$0	$0
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$0	$0
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$0	$0	$0	$0	$0	$0
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$0	$0	$0	$0
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$0	$0	$0	$0	$0	$0
1706020912	$0	$0	$0	$0	$0	$0
1706020913	$0	$0	$0	$0	$0	$0
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$0	$0	$0	$0	$0	$0
1706021002	$0	$0	$0	$0	$0	$0
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$0	$0	$0	$0	$0	$0
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$0	$0	$0	$0	$0	$0
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$0	$0	$0	$0	$0	$0
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$0	$0	$0	$0	$0	$0
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$0	$0	$0	$0	$0	$0
1706030613	$0	$0	$0	$0	$0	$0
1706030614	$0	$0	$0	$0	$0	$0
1706030615	$0	$0	$0	$0	$0	$0
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$132,800	$132,800	$328,400	$328,400	$524,000	$524,000
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$0	$0	$0	$0	$0	$0
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$0	$0	$0	$0	$0	$0
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1707010501	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707010504	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$0	$0	$0	$0
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$0	$0	$0	$0
1708000109	$664,000	$664,000	$1,642,000	$1,642,000	$2,620,000	$2,620,000
1708000205	$0	$0	$0	$0	$0	$0
1708000206	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1708000301	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1709000704	$0	$0	$0	$0	$0	$0
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$0	$0	$0	$0
1709001106	$0	$0	$0	$0	$0	$0
1709001201	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1709001202	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1709001203	$997,245	$997,245	$2,466,079	$2,466,079	$3,934,913	$3,934,913

Upper Willamette O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$0	$0	$0	$0	$0	$0
1709000304	$0	$0	$0	$0	$0	$0
1709000306	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$221,610	$221,610	$548,018	$548,018	$874,425	$874,425
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$0	$0	$0	$0
1709000704	$0	$0	$0	$0	$0	$0
1709000801	$0	$0	$0	$0	$0	$0
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$221,610	$221,610	$548,018	$548,018	$874,425	$874,425
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$0	$0	$0	$0
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$0	$0	$0	$0
1709001001	$0	$0	$0	$0	$0	$0
1709001002	$0	$0	$0	$0	$0	$0
1709001003	$0	$0	$0	$0	$0	$0
1709001004	$0	$0	$0	$0	$0	$0
1709001005	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1709001201	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1709001203	$997,245	$997,245	$2,466,079	$2,466,079	$3,934,913	$3,934,913

Middle Columbia River O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1703000101	$0	$0	$0	$0	$0	$0
1703000102	$0	$0	$0	$0	$0	$0
1703000103	$0	$0	$0	$0	$0	$0
1703000104	$0	$0	$0	$0	$0	$0
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$166,000	$166,000	$410,500	$410,500	$655,000	$655,000
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1703000303	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1703000304	$0	$0	$0	$0	$0	$0
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$0	$0	$0	$0	$0	$0
1703000307	$0	$0	$0	$0	$0	$0
1707010101	$249,000	$249,000	$615,750	$615,750	$982,500	$982,500
1707010102	$0	$0	$0	$0	$0	$0
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$0	$0	$0	$0	$0	$0
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$110,805	$110,805	$274,009	$274,009	$437,213	$437,213
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$0	$0	$0	$0	$0	$0
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$0	$0	$0	$0	$0	$0
1707010209	$0	$0	$0	$0	$0	$0
1707010210	$0	$0	$0	$0	$0	$0
1707010211	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$0	$0	$0	$0	$0	$0
1707010304	$332,415	$332,415	$822,026	$822,026	$1,311,638	$1,311,638
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$221,610	$221,610	$548,018	$548,018	$874,425	$874,425

Middle Columbia River O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$0	$0	$0	$0	$0	$0
1707010501	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$0	$0	$0	$0
1707010505	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$0	$0	$0	$0
1707010513	$0	$0	$0	$0	$0	$0
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$0	$0	$0	$0	$0	$0
1707010603	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707010604	$83,000	$83,000	$205,250	$205,250	$327,500	$327,500
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$0	$0	$0	$0
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$132,800	$132,800	$328,400	$328,400	$524,000	$524,000
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Dredging Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$0	$0	$0	$0	$0	$0
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$265,600	$265,600	$656,800	$656,800	$1,048,000	$1,048,000
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$0	$0	$0	$0	$0	$0
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$0	$0	$0	$0
1707030611	$0	$0	$0	$0	$0	$0
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Appendix F-10
Annual NPDES-Permitted Activity Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$8,380	$11,244	$46,014	$48,878	$83,648	$86,512
1711000202	$0	$0	$40,800	$40,800	$81,600	$81,600
1711000204	$8,380	$11,244	$20,174	$23,038	$31,968	$34,832
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$1,360	$1,360	$2,720	$2,720
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$0	$0	$10,880	$10,880	$21,760	$21,760
1711000405	$8,380	$11,244	$56,894	$59,758	$105,408	$108,272
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$0	$0	$2,720	$2,720	$5,440	$5,440
1711000506	$0	$0	$0	$0	$0	$0
1711000507	$0	$0	$1,360	$1,360	$2,720	$2,720
1711000508	$0	$0	$1,360	$1,360	$2,720	$2,720
1711000601	$0	$0	$0	$0	$0	$0
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$1,360	$1,360	$2,720	$2,720
1711000604	$0	$0	$4,080	$4,080	$8,160	$8,160
1711000701	$0	$0	$5,440	$5,440	$10,880	$10,880
1711000702	$8,380	$11,244	$35,134	$37,998	$61,888	$64,752
1711000801	$0	$0	$9,520	$9,520	$19,040	$19,040
1711000802	$0	$0	$9,520	$9,520	$19,040	$19,040
1711000803	$0	$0	$12,240	$12,240	$24,480	$24,480
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$0	$0	$1,360	$1,360	$2,720	$2,720
1711000903	$0	$0	$8,160	$8,160	$16,320	$16,320
1711000904	$0	$0	$0	$0	$0	$0
1711000905	$0	$0	$9,520	$9,520	$19,040	$19,040
1711001003	$0	$0	$8,160	$8,160	$16,320	$16,320
1711001004	$0	$0	$9,520	$9,520	$19,040	$19,040
1711001101	$0	$0	$9,520	$9,520	$19,040	$19,040
1711001102	$8,380	$11,244	$46,014	$48,878	$83,648	$86,512
1711001201	$0	$0	$8,160	$8,160	$16,320	$16,320
1711001202	$0	$0	$9,520	$9,520	$19,040	$19,040
1711001203	$0	$0	$58,480	$58,480	$116,960	$116,960
1711001204	$0	$0	$14,960	$14,960	$29,920	$29,920
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$0	$0	$4,080	$4,080	$8,160	$8,160
1711001303	$8,380	$11,244	$63,694	$66,558	$119,008	$121,872
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$25,141	$33,732	$57,802	$66,394	$90,464	$99,055
1711001403	$0	$0	$6,800	$6,800	$13,600	$13,600
1711001404	$0	$0	$1,360	$1,360	$2,720	$2,720
1711001405	$41,902	$56,221	$107,671	$121,990	$173,439	$187,758
1711001502	$0	$0	$6,800	$6,800	$13,600	$13,600
1711001503	$0	$0	$16,320	$16,320	$32,640	$32,640
1711001601	$0	$0	$1,360	$1,360	$2,720	$2,720
1711001602	$8,380	$11,244	$26,974	$29,838	$45,568	$48,432
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$2,720	$2,720	$5,440	$5,440
1711001803	$0	$0	$1,360	$1,360	$2,720	$2,720
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$4,080	$4,080	$8,160	$8,160
1711001808	$0	$0	$27,200	$27,200	$54,400	$54,400
1711001900	$0	$0	$32,640	$32,640	$65,280	$65,280
1711001901	$25,141	$33,732	$86,362	$94,954	$147,584	$156,175
1711001902	$0	$0	$10,880	$10,880	$21,760	$21,760
1711001904	$8,380	$11,244	$35,134	$37,998	$61,888	$64,752
1711002003	$0	$0	$8,160	$8,160	$16,320	$16,320
1711002004	$8,380	$11,244	$28,334	$31,198	$48,288	$51,152
1711002007	$0	$0	$1,360	$1,360	$2,720	$2,720
N01	$0	$0	$19,040	$19,040	$38,080	$38,080
N02	$0	$0	$4,080	$4,080	$8,160	$8,160
N03	$0	$0	$27,200	$27,200	$54,400	$54,400
N04	$0	$0	$1,360	$1,360	$2,720	$2,720
N05	$0	$0	$2,720	$2,720	$5,440	$5,440
N06	$8,380	$11,244	$21,534	$24,398	$34,688	$37,552
N07	$0	$0	$2,720	$2,720	$5,440	$5,440
N08	$0	$0	$5,440	$5,440	$10,880	$10,880
N09	$8,380	$11,244	$36,494	$39,358	$64,608	$67,472
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$2,720	$2,720	$5,440	$5,440
N12	$0	$0	$5,440	$5,440	$10,880	$10,880
N13	$0	$0	$2,720	$2,720	$5,440	$5,440
N14	$0	$0	$16,320	$16,320	$32,640	$32,640
N15	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$1,360	$1,360	$2,720	$2,720
N18	$0	$0	$8,160	$8,160	$16,320	$16,320
N19	$0	$0	$5,440	$5,440	$10,880	$10,880

Lower Columbia River chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$5,440	$5,440	$10,880	$10,880
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$8,380	$11,244	$20,174	$23,038	$31,968	$34,832
1707010509	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010513	$0	$0	$5,440	$5,440	$10,880	$10,880
1708000101	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000102	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$8,380	$11,244	$26,974	$29,838	$45,568	$48,432
1708000107	$0	$0	$19,040	$19,040	$38,080	$38,080
1708000108	$8,380	$11,244	$16,094	$18,958	$23,808	$26,672
1708000109	$41,902	$56,221	$102,231	$116,550	$162,559	$176,878
1708000205	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000206	$0	$0	$6,800	$6,800	$13,600	$13,600
1708000301	$8,380	$11,244	$18,814	$21,678	$29,248	$32,112
1708000302	$16,761	$22,488	$32,188	$37,916	$47,616	$53,343
1708000303	$0	$0	$2,720	$2,720	$5,440	$5,440
1708000304	$16,761	$22,488	$43,068	$48,796	$69,376	$75,103
1708000305	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000306	$8,380	$11,244	$14,734	$17,598	$21,088	$23,952
1708000401	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000402	$0	$0	$2,720	$2,720	$5,440	$5,440
1708000403	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000404	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000502	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000503	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$9,520	$9,520	$19,040	$19,040
1708000508	$0	$0	$10,880	$10,880	$21,760	$21,760
1708000601	$0	$0	$17,680	$17,680	$35,360	$35,360
1708000602	$8,380	$11,244	$24,254	$27,118	$40,128	$42,992
1708000603	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000704	$33,521	$44,977	$61,656	$73,112	$89,791	$101,247
1709001105	$0	$0	$1,360	$1,360	$2,720	$2,720
1709001106	$8,380	$11,244	$24,254	$27,118	$40,128	$42,992
1709001201	$25,141	$33,732	$46,922	$55,514	$68,704	$77,295
1709001202	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1709001203	$41,902	$56,221	$157,991	$172,310	$274,079	$288,398

Upper Willamette River chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000106	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000107	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000201	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$8,380	$11,244	$16,094	$18,958	$23,808	$26,672
1709000205	$0	$0	$8,160	$8,160	$16,320	$16,320
1709000301	$0	$0	$28,560	$28,560	$57,120	$57,120
1709000302	$25,141	$33,732	$80,922	$89,514	$136,704	$145,295
1709000303	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$33,521	$44,977	$73,896	$85,352	$114,271	$125,727
1709000305	$8,380	$11,244	$20,174	$23,038	$31,968	$34,832
1709000306	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000401	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$8,380	$11,244	$21,534	$24,398	$34,688	$37,552
1709000504	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$8,380	$11,244	$14,734	$17,598	$21,088	$23,952
1709000601	$16,761	$22,488	$30,828	$36,556	$44,896	$50,623
1709000602	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000603	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000606	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000607	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000608	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000701	$0	$0	$6,800	$6,800	$13,600	$13,600
1709000702	$8,380	$11,244	$22,894	$25,758	$37,408	$40,272
1709000703	$25,141	$33,732	$57,802	$66,394	$90,464	$99,055
1709000704	$33,521	$44,977	$61,656	$73,112	$89,791	$101,247
1709000804	$0	$0	$5,440	$5,440	$10,880	$10,880
1709000805	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000806	$0	$0	$9,520	$9,520	$19,040	$19,040
1709000807	$8,380	$11,244	$16,094	$18,958	$23,808	$26,672
1709000901	$8,380	$11,244	$21,534	$24,398	$34,688	$37,552
1709000902	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1709000903	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000904	$0	$0	$12,240	$12,240	$24,480	$24,480
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$4,080	$4,080	$8,160	$8,160
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$2,720	$2,720	$5,440	$5,440
1709001105	$0	$0	$1,360	$1,360	$2,720	$2,720
1709001106	$8,380	$11,244	$24,254	$27,118	$40,128	$42,992
1709001201	$25,141	$33,732	$46,922	$55,514	$68,704	$77,295

Upper Willamette River chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$41,902	$56,221	$157,991	$172,310	$274,079	$288,398

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$5,440	$5,440	$10,880	$10,880
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$1,360	$1,360	$2,720	$2,720
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$5,440	$5,440	$10,880	$10,880
1702000807	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$16,761	$22,488	$55,308	$61,036	$93,856	$99,583
1702001003	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001004	$0	$0	$4,080	$4,080	$8,160	$8,160
1702001101	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001104	$0	$0	$0	$0	$0	$0
1702001105	$0	$0	$6,800	$6,800	$13,600	$13,600
1702001604	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001605	$0	$0	$6,800	$6,800	$13,600	$13,600
1702001606	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1707010101	$0	$0	$16,320	$16,320	$32,640	$32,640
1707010102	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010106	$0	$0	$5,440	$5,440	$10,880	$10,880
1707010109	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010114	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1707010501	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010504	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1707010512	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010513	$0	$0	$5,440	$5,440	$10,880	$10,880
1708000107	$0	$0	$19,040	$19,040	$38,080	$38,080

Oregon Coast coho salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$8,380	$11,244	$18,814	$21,678	$29,248	$32,112
1710020201	$0	$0	$2,720	$2,720	$5,440	$5,440
1710020202	$0	$0	$1,360	$1,360	$2,720	$2,720
1710020203	$0	$0	$0	$0	$0	$0
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$1,360	$1,360	$2,720	$2,720
1710020206	$0	$0	$1,360	$1,360	$2,720	$2,720
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$0	$0	$5,440	$5,440	$10,880	$10,880
1710020303	$0	$0	$1,360	$1,360	$2,720	$2,720
1710020304	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1710020305	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$0	$0	$5,440	$5,440	$10,880	$10,880
1710020309	$0	$0	$5,440	$5,440	$10,880	$10,880
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$8,380	$11,244	$25,614	$28,478	$42,848	$45,712
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1710020408	$0	$0	$2,720	$2,720	$5,440	$5,440
1710020409	$0	$0	$8,160	$8,160	$16,320	$16,320
1710020501	$0	$0	$1,360	$1,360	$2,720	$2,720
1710020502	$0	$0	$1,360	$1,360	$2,720	$2,720
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$0	$0	$4,080	$4,080	$8,160	$8,160
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$2,720	$2,720	$5,440	$5,440
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$0	$0	$0	$0	$0	$0
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$0	$0	$0	$0	$0	$0
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$0	$0	$8,160	$8,160	$16,320	$16,320

Oregon Coast coho salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$0	$0	$2,720	$2,720	$5,440	$5,440
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$1,360	$1,360	$2,720	$2,720
1710030111	$0	$0	$1,360	$1,360	$2,720	$2,720
1710030112	$0	$0	$13,600	$13,600	$27,200	$27,200
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$1,360	$1,360	$2,720	$2,720
1710030205	$0	$0	$4,080	$4,080	$8,160	$8,160
1710030207	$0	$0	$5,440	$5,440	$10,880	$10,880
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$6,800	$6,800	$13,600	$13,600
1710030210	$0	$0	$13,600	$13,600	$27,200	$27,200
1710030211	$0	$0	$2,720	$2,720	$5,440	$5,440
1710030212	$0	$0	$0	$0	$0	$0
1710030213	$8,380	$11,244	$25,614	$28,478	$42,848	$45,712
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$0	$0	$4,080	$4,080	$8,160	$8,160
1710030303	$0	$0	$10,880	$10,880	$21,760	$21,760
1710030304	$0	$0	$0	$0	$0	$0
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$0	$0	$1,360	$1,360	$2,720	$2,720
1710030308	$0	$0	$6,800	$6,800	$13,600	$13,600
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$2,720	$2,720	$5,440	$5,440
1710030404	$33,521	$44,977	$64,376	$75,832	$95,231	$106,687
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$2,720	$2,720	$5,440	$5,440
1710030503	$0	$0	$4,080	$4,080	$8,160	$8,160
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$0	$0	$2,720	$2,720	$5,440	$5,440
1710030506	$0	$0	$10,880	$10,880	$21,760	$21,760
1710030603	$0	$0	$0	$0	$0	$0
1710030604	$0	$0	$1,360	$1,360	$2,720	$2,720

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$2,720	$2,720	$5,440	$5,440
1711001803	$0	$0	$1,360	$1,360	$2,720	$2,720
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$4,080	$4,080	$8,160	$8,160
1711001807	$0	$0	$6,800	$6,800	$13,600	$13,600
1711001808	$0	$0	$27,200	$27,200	$54,400	$54,400
1711001908	$0	$0	$10,880	$10,880	$21,760	$21,760
1711002001	$0	$0	$6,800	$6,800	$13,600	$13,600
1711002002	$0	$0	$4,080	$4,080	$8,160	$8,160
1711002003	$0	$0	$8,160	$8,160	$16,320	$16,320
N15	$0	$0	$0	$0	$0	$0
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$1,360	$1,360	$2,720	$2,720
N18	$0	$0	$8,160	$8,160	$16,320	$16,320
N19	$0	$0	$5,440	$5,440	$10,880	$10,880

Columbia River chum salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010512	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010513	$0	$0	$5,440	$5,440	$10,880	$10,880
1708000106	$8,380	$11,244	$26,974	$29,838	$45,568	$48,432
1708000107	$0	$0	$19,040	$19,040	$38,080	$38,080
1708000109	$41,902	$56,221	$102,231	$116,550	$162,559	$176,878
1708000205	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000206	$0	$0	$6,800	$6,800	$13,600	$13,600
1708000301	$8,380	$11,244	$18,814	$21,678	$29,248	$32,112
1708000304	$16,761	$22,488	$43,068	$48,796	$69,376	$75,103
1708000305	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000503	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$9,520	$9,520	$19,040	$19,040
1708000508	$0	$0	$10,880	$10,880	$21,760	$21,760

Columbia River chum salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$8,380	$11,244	$24,254	$27,118	$40,128	$42,992
1708000603	$0	$0	$4,080	$4,080	$8,160	$8,160

Ozette Lake sockeye salmon ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$2,720	$2,720	$5,440	$5,440

Upper Columbia River O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$0	$0	$0	$0	$0	$0
1702000504	$0	$0	$1,360	$1,360	$2,720	$2,720
1702000505	$0	$0	$5,440	$5,440	$10,880	$10,880
1702000601	$0	$0	$1,360	$1,360	$2,720	$2,720
1702000602	$0	$0	$2,720	$2,720	$5,440	$5,440
1702000603	$0	$0	$0	$0	$0	$0
1702000604	$0	$0	$5,440	$5,440	$10,880	$10,880
1702000605	$0	$0	$0	$0	$0	$0
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$1,360	$1,360	$2,720	$2,720
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$5,440	$5,440	$10,880	$10,880
1702000807	$0	$0	$0	$0	$0	$0
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$16,761	$22,488	$55,308	$61,036	$93,856	$99,583
1702001003	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001004	$0	$0	$4,080	$4,080	$8,160	$8,160
1702001101	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001104	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$0	$0	$6,800	$6,800	$13,600	$13,600
1702001204	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001509	$0	$0	$6,800	$6,800	$13,600	$13,600
1702001604	$0	$0	$2,720	$2,720	$5,440	$5,440
1702001605	$0	$0	$6,800	$6,800	$13,600	$13,600
1702001606	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1707010101	$0	$0	$16,320	$16,320	$32,640	$32,640
1707010102	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010106	$0	$0	$5,440	$5,440	$10,880	$10,880
1707010109	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010114	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1707010501	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010504	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1707010512	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010513	$0	$0	$5,440	$5,440	$10,880	$10,880
1708000107	$0	$0	$19,040	$19,040	$38,080	$38,080

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$0	$0	$0	$0	$0	$0
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010406	$8,380	$11,244	$14,734	$17,598	$21,088	$23,952

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$0	$0	$0	$0	$0	$0
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$0	$0	$0	$0	$0	$0
1706010410	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010411	$0	$0	$2,720	$2,720	$5,440	$5,440
1706010501	$0	$0	$5,440	$5,440	$10,880	$10,880
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010702	$0	$0	$6,800	$6,800	$13,600	$13,600
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010707	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010708	$0	$0	$1,360	$1,360	$2,720	$2,720
1706010808	$0	$0	$1,360	$1,360	$2,720	$2,720
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1706020101	$0	$0	$0	$0	$0	$0
1706020104	$0	$0	$0	$0	$0	$0
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$0	$0	$0	$0	$0	$0
1706020113	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$0	$0	$0	$0	$0	$0
1706020117	$0	$0	$0	$0	$0	$0
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$8,380	$11,244	$14,734	$17,598	$21,088	$23,952
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$0	$0	$0	$0	$0	$0
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$0	$0	$0	$0	$0	$0
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$0	$0	$0	$0	$0	$0
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$1,360	$1,360	$2,720	$2,720
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$1,360	$1,360	$2,720	$2,720
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$0	$0	$0	$0	$0	$0
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$0	$0	$0	$0	$0	$0
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$1,360	$1,360	$2,720	$2,720
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$0	$0	$0	$0	$0	$0
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$2,720	$2,720	$5,440	$5,440
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$0	$0	$0	$0	$0	$0
1706020912	$0	$0	$0	$0	$0	$0
1706020913	$0	$0	$0	$0	$0	$0
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$2,720	$2,720	$5,440	$5,440
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$0	$0	$0	$0	$0	$0
1706021002	$0	$0	$0	$0	$0	$0
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$0	$0	$5,440	$5,440	$10,880	$10,880
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$0	$0	$2,720	$2,720	$5,440	$5,440
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$1,360	$1,360	$2,720	$2,720
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$5,440	$5,440	$10,880	$10,880
1706030513	$0	$0	$1,360	$1,360	$2,720	$2,720
1706030601	$16,761	$22,488	$29,468	$35,196	$42,176	$47,903
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$2,720	$2,720	$5,440	$5,440
1706030604	$0	$0	$2,720	$2,720	$5,440	$5,440
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$0	$0	$2,720	$2,720	$5,440	$5,440
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$0	$0	$1,360	$1,360	$2,720	$2,720

Snake River Basin O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$0	$0	$5,440	$5,440	$10,880	$10,880
1706030613	$0	$0	$2,720	$2,720	$5,440	$5,440
1706030614	$0	$0	$2,720	$2,720	$5,440	$5,440
1706030615	$0	$0	$0	$0	$0	$0
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$0	$0	$0	$0	$0	$0
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$4,080	$4,080	$8,160	$8,160
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$0	$0	$5,440	$5,440	$10,880	$10,880
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$0	$0	$16,320	$16,320	$32,640	$32,640
1707010102	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010106	$0	$0	$5,440	$5,440	$10,880	$10,880
1707010109	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010114	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1707010501	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010504	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1707010512	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010513	$0	$0	$5,440	$5,440	$10,880	$10,880
1708000107	$0	$0	$19,040	$19,040	$38,080	$38,080

Lower Columbia River O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$5,440	$5,440	$10,880	$10,880
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$8,380	$11,244	$20,174	$23,038	$31,968	$34,832
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010513	$0	$0	$5,440	$5,440	$10,880	$10,880
1708000101	$0	$0	$1,360	$1,360	$2,720	$2,720

Lower Columbia River O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$8,380	$11,244	$26,974	$29,838	$45,568	$48,432
1708000107	$0	$0	$19,040	$19,040	$38,080	$38,080
1708000108	$8,380	$11,244	$16,094	$18,958	$23,808	$26,672
1708000109	$41,902	$56,221	$102,231	$116,550	$162,559	$176,878
1708000205	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000206	$0	$0	$6,800	$6,800	$13,600	$13,600
1708000301	$8,380	$11,244	$18,814	$21,678	$29,248	$32,112
1708000401	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000402	$0	$0	$2,720	$2,720	$5,440	$5,440
1708000403	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000404	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000502	$0	$0	$1,360	$1,360	$2,720	$2,720
1708000503	$0	$0	$4,080	$4,080	$8,160	$8,160
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$9,520	$9,520	$19,040	$19,040
1708000508	$0	$0	$10,880	$10,880	$21,760	$21,760
1709000704	$33,521	$44,977	$61,656	$73,112	$89,791	$101,247
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$2,720	$2,720	$5,440	$5,440
1709001105	$0	$0	$1,360	$1,360	$2,720	$2,720
1709001106	$8,380	$11,244	$24,254	$27,118	$40,128	$42,992
1709001201	$25,141	$33,732	$46,922	$55,514	$68,704	$77,295
1709001202	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1709001203	$41,902	$56,221	$157,991	$172,310	$274,079	$288,398

Upper Willamette O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$0	$0	$0	$0	$0	$0
1709000304	$33,521	$44,977	$73,896	$85,352	$114,271	$125,727
1709000306	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000504	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$8,380	$11,244	$14,734	$17,598	$21,088	$23,952
1709000601	$16,761	$22,488	$30,828	$36,556	$44,896	$50,623
1709000602	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000603	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000606	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000607	$0	$0	$1,360	$1,360	$2,720	$2,720
1709000608	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000701	$0	$0	$6,800	$6,800	$13,600	$13,600
1709000702	$8,380	$11,244	$22,894	$25,758	$37,408	$40,272
1709000703	$25,141	$33,732	$57,802	$66,394	$90,464	$99,055
1709000704	$33,521	$44,977	$61,656	$73,112	$89,791	$101,247
1709000801	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000802	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$5,440	$5,440	$10,880	$10,880
1709000805	$0	$0	$2,720	$2,720	$5,440	$5,440
1709000806	$0	$0	$9,520	$9,520	$19,040	$19,040
1709000807	$8,380	$11,244	$16,094	$18,958	$23,808	$26,672
1709000901	$8,380	$11,244	$21,534	$24,398	$34,688	$37,552
1709000902	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1709000903	$0	$0	$4,080	$4,080	$8,160	$8,160
1709000904	$0	$0	$12,240	$12,240	$24,480	$24,480
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$4,080	$4,080	$8,160	$8,160
1709001001	$8,380	$11,244	$18,814	$21,678	$29,248	$32,112
1709001002	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1709001003	$0	$0	$1,360	$1,360	$2,720	$2,720
1709001004	$8,380	$11,244	$39,214	$42,078	$70,048	$72,912
1709001005	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1709001201	$25,141	$33,732	$46,922	$55,514	$68,704	$77,295
1709001203	$41,902	$56,221	$157,991	$172,310	$274,079	$288,398

Middle Columbia River O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1703000101	$0	$0	$9,520	$9,520	$19,040	$19,040
1703000102	$0	$0	$2,720	$2,720	$5,440	$5,440
1703000103	$8,380	$11,244	$35,134	$37,998	$61,888	$64,752
1703000104	$0	$0	$12,240	$12,240	$24,480	$24,480
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$1,360	$1,360	$2,720	$2,720
1703000203	$0	$0	$2,720	$2,720	$5,440	$5,440
1703000301	$0	$0	$2,720	$2,720	$5,440	$5,440
1703000302	$8,380	$11,244	$36,494	$39,358	$64,608	$67,472
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$0	$0	$13,600	$13,600	$27,200	$27,200
1703000305	$0	$0	$1,360	$1,360	$2,720	$2,720
1703000306	$16,761	$22,488	$81,148	$86,876	$145,536	$151,263
1703000307	$0	$0	$12,240	$12,240	$24,480	$24,480
1707010101	$0	$0	$16,320	$16,320	$32,640	$32,640
1707010102	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010105	$0	$0	$26,520	$26,520	$53,040	$53,040
1707010106	$0	$0	$5,440	$5,440	$10,880	$10,880
1707010109	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010113	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010114	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$8,380	$11,244	$17,454	$20,318	$26,528	$29,392
1707010203	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010204	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010209	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010210	$0	$0	$0	$0	$0	$0
1707010211	$8,380	$11,244	$16,094	$18,958	$23,808	$26,672
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010303	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010304	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010308	$8,380	$11,244	$13,374	$16,238	$18,368	$21,232
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$8,380	$11,244	$21,534	$24,398	$34,688	$37,552
1707010501	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010502	$0	$0	$2,720	$2,720	$5,440	$5,440
1707010503	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010504	$16,761	$22,488	$40,348	$46,076	$63,936	$69,663
1707010505	$0	$0	$4,080	$4,080	$8,160	$8,160
1707010512	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010513	$0	$0	$5,440	$5,440	$10,880	$10,880
1707010601	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010602	$0	$0	$1,360	$1,360	$2,720	$2,720
1707010603	$0	$0	$13,600	$13,600	$27,200	$27,200
1707010604	$0	$0	$6,800	$6,800	$13,600	$13,600
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$1,360	$1,360	$2,720	$2,720
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$1,360	$1,360	$2,720	$2,720
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$4,080	$4,080	$8,160	$8,160
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$0	$0	$0	$0	$0	$0
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$1,360	$1,360	$2,720	$2,720
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual NPDES-Permitted Activity Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$1,360	$1,360	$2,720	$2,720
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$0	$0	$1,360	$1,360	$2,720	$2,720
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$0	$0	$0	$0	$0	$0
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$0	$0	$1,360	$1,360	$2,720	$2,720
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$1,360	$1,360	$2,720	$2,720
1707030607	$0	$0	$1,360	$1,360	$2,720	$2,720
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$1,360	$1,360	$2,720	$2,720
1707030611	$0	$0	$0	$0	$0	$0
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$19,040	$19,040	$38,080	$38,080

Appendix F.11
Annual Mining Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$0	$0	$0	$0	$0	$0
1711000202	$0	$0	$53,333	$53,333	$106,667	$106,667
1711000204	$0	$0	$0	$0	$0	$0
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$0	$0	$0	$0
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$0	$0	$0	$0	$0	$0
1711000405	$0	$0	$0	$0	$0	$0
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$0	$0	$0	$0	$0	$0
1711000506	$0	$0	$0	$0	$0	$0
1711000507	$0	$0	$0	$0	$0	$0
1711000508	$0	$0	$26,667	$26,667	$53,333	$53,333
1711000601	$0	$0	$0	$0	$0	$0
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$0	$0	$0	$0
1711000604	$0	$0	$0	$0	$0	$0
1711000701	$0	$0	$26,667	$26,667	$53,333	$53,333
1711000702	$0	$0	$53,333	$53,333	$106,667	$106,667
1711000801	$0	$0	$0	$0	$0	$0
1711000802	$0	$0	$0	$0	$0	$0
1711000803	$0	$0	$0	$0	$0	$0
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$0	$0	$0	$0	$0	$0
1711000903	$0	$0	$0	$0	$0	$0
1711000904	$0	$0	$0	$0	$0	$0
1711000905	$0	$0	$0	$0	$0	$0
1711001003	$0	$0	$0	$0	$0	$0
1711001004	$0	$0	$0	$0	$0	$0
1711001101	$0	$0	$0	$0	$0	$0
1711001102	$0	$0	$0	$0	$0	$0
1711001201	$0	$0	$0	$0	$0	$0
1711001202	$0	$0	$26,667	$26,667	$53,333	$53,333
1711001203	$0	$0	$0	$0	$0	$0
1711001204	$0	$0	$0	$0	$0	$0
1711001301	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$0	$0	$0	$0	$0	$0
1711001303	$0	$0	$0	$0	$0	$0
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$0	$0	$0	$0	$0	$0
1711001403	$0	$0	$0	$0	$0	$0
1711001404	$0	$0	$0	$0	$0	$0
1711001405	$0	$0	$0	$0	$0	$0
1711001502	$0	$0	$0	$0	$0	$0
1711001503	$0	$0	$26,667	$26,667	$53,333	$53,333
1711001601	$0	$0	$0	$0	$0	$0
1711001602	$0	$0	$53,333	$53,333	$106,667	$106,667
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001808	$0	$0	$53,333	$53,333	$106,667	$106,667
1711001900	$0	$0	$80,000	$80,000	$160,000	$160,000
1711001901	$0	$0	$133,333	$133,333	$266,667	$266,667
1711001902	$0	$0	$53,333	$53,333	$106,667	$106,667
1711001904	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$53,333	$53,333	$106,667	$106,667
1711002004	$0	$0	$53,333	$53,333	$106,667	$106,667
1711002007	$0	$0	$0	$0	$0	$0
N01	$0	$0	$0	$0	$0	$0
N02	$0	$0	$0	$0	$0	$0
N03	$0	$0	$0	$0	$0	$0
N04	$0	$0	$0	$0	$0	$0
N05	$0	$0	$0	$0	$0	$0
N06	$0	$0	$0	$0	$0	$0
N07	$0	$0	$0	$0	$0	$0
N08	$0	$0	$0	$0	$0	$0
N09	$0	$0	$0	$0	$0	$0
N10	$0	$0	$0	$0	$0	$0
N11	$0	$0	$0	$0	$0	$0
N12	$0	$0	$0	$0	$0	$0
N13	$0	$0	$0	$0	$0	$0
N14	$0	$0	$0	$0	$0	$0
N15	$0	$0	$0	$0	$0	$0

Puget Sound chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$26,667	$26,667	$53,333	$53,333
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010513	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$80,000	$80,000	$160,000	$160,000
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000109	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000205	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000302	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000303	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1708000601	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000602	$0	$0	$133,333	$133,333	$266,667	$266,667
1708000603	$0	$0	$0	$0	$0	$0
1709000704	$0	$0	$53,333	$53,333	$106,667	$106,667
1709001105	$0	$0	$26,667	$26,667	$53,333	$53,333
1709001106	$0	$0	$133,333	$133,333	$266,667	$266,667
1709001201	$0	$0	$80,000	$80,000	$160,000	$160,000
1709001202	$0	$0	$26,667	$26,667	$53,333	$53,333
1709001203	$0	$0	$213,333	$213,333	$426,667	$426,667

Upper Willamette River chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$0	$0	$0	$0	$0	$0
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$0	$0	$0	$0	$0	$0
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$0	$0	$0	$0	$0	$0
1709000201	$0	$0	$0	$0	$0	$0
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$0	$0	$0	$0	$0	$0
1709000205	$0	$0	$0	$0	$0	$0
1709000301	$0	$0	$0	$0	$0	$0
1709000302	$0	$0	$53,333	$53,333	$106,667	$106,667
1709000303	$0	$0	$0	$0	$0	$0

Upper Willamette River chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$0	$0	$0	$0	$0	$0
1709000305	$0	$0	$0	$0	$0	$0
1709000306	$0	$0	$0	$0	$0	$0
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$0	$0	$0	$0	$0	$0
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$26,667	$26,667	$53,333	$53,333
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$53,333	$53,333	$106,667	$106,667
1709000704	$0	$0	$53,333	$53,333	$106,667	$106,667
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$53,333	$53,333	$106,667	$106,667
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$53,333	$53,333	$106,667	$106,667
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$26,667	$26,667	$53,333	$53,333
1709001106	$0	$0	$133,333	$133,333	$266,667	$266,667
1709001201	$0	$0	$80,000	$80,000	$160,000	$160,000

Upper Willamette River chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$0	$0	$213,333	$213,333	$426,667	$426,667

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$53,333	$53,333	$106,667	$106,667
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000806	$0	$0	$53,333	$53,333	$106,667	$106,667
1702000807	$0	$0	$26,667	$26,667	$53,333	$53,333
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$0	$0	$0	$0	$0	$0
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$0	$0	$26,667	$26,667	$53,333	$53,333
1702001105	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$106,667	$106,667	$213,333	$213,333
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$106,667	$106,667	$213,333	$213,333
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$53,333	$53,333	$106,667	$106,667
1707010512	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010513	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000107	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$0	$0	$80,000	$80,000	$160,000	$160,000
1710020201	$0	$0	$26,667	$26,667	$53,333	$53,333
1710020202	$0	$0	$0	$0	$0	$0
1710020203	$0	$0	$26,667	$26,667	$53,333	$53,333
1710020204	$0	$0	$0	$0	$0	$0
1710020205	$0	$0	$53,333	$53,333	$106,667	$106,667
1710020206	$0	$0	$0	$0	$0	$0
1710020301	$0	$0	$0	$0	$0	$0
1710020302	$0	$0	$0	$0	$0	$0
1710020303	$0	$0	$0	$0	$0	$0
1710020304	$0	$0	$0	$0	$0	$0
1710020305	$0	$0	$0	$0	$0	$0
1710020306	$0	$0	$0	$0	$0	$0
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$0	$0	$0	$0	$0	$0
1710020309	$0	$0	$0	$0	$0	$0
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$0	$0	$0	$0	$0	$0
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$0	$0	$0	$0	$0	$0
1710020408	$0	$0	$0	$0	$0	$0
1710020409	$0	$0	$0	$0	$0	$0
1710020501	$0	$0	$0	$0	$0	$0
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$0	$0	$0	$0	$0	$0
1710020505	$0	$0	$0	$0	$0	$0
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$0	$0	$0	$0	$0	$0
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$0	$0	$0	$0	$0	$0
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$0	$0	$0	$0	$0	$0

Oregon Coast coho salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$0	$0	$0	$0	$0	$0
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$0	$0	$0	$0	$0	$0
1710030112	$0	$0	$80,000	$80,000	$160,000	$160,000
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$0	$0	$26,667	$26,667	$53,333	$53,333
1710030207	$0	$0	$26,667	$26,667	$53,333	$53,333
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$0	$0	$26,667	$26,667	$53,333	$53,333
1710030210	$0	$0	$80,000	$80,000	$160,000	$160,000
1710030211	$0	$0	$80,000	$80,000	$160,000	$160,000
1710030212	$0	$0	$26,667	$26,667	$53,333	$53,333
1710030213	$0	$0	$293,333	$293,333	$586,667	$586,667
1710030301	$0	$0	$106,667	$106,667	$213,333	$213,333
1710030302	$0	$0	$26,667	$26,667	$53,333	$53,333
1710030303	$0	$0	$0	$0	$0	$0
1710030304	$0	$0	$53,333	$53,333	$106,667	$106,667
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$0	$0	$0	$0	$0	$0
1710030308	$0	$0	$80,000	$80,000	$160,000	$160,000
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$0	$0	$0	$0	$0	$0
1710030404	$0	$0	$80,000	$80,000	$160,000	$160,000
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$0	$0	$0	$0	$0	$0
1710030503	$0	$0	$80,000	$80,000	$160,000	$160,000
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$0	$0	$26,667	$26,667	$53,333	$53,333
1710030506	$0	$0	$53,333	$53,333	$106,667	$106,667
1710030603	$0	$0	$53,333	$53,333	$106,667	$106,667
1710030604	$0	$0	$26,667	$26,667	$53,333	$53,333

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001807	$0	$0	$0	$0	$0	$0
1711001808	$0	$0	$53,333	$53,333	$106,667	$106,667
1711001908	$0	$0	$0	$0	$0	$0
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$53,333	$53,333	$106,667	$106,667
N15	$0	$0	$0	$0	$0	$0
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$26,667	$26,667	$53,333	$53,333
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010513	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000106	$0	$0	$80,000	$80,000	$160,000	$160,000
1708000107	$0	$0	$0	$0	$0	$0
1708000109	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000205	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$0	$0	$133,333	$133,333	$266,667	$266,667
1708000603	$0	$0	$0	$0	$0	$0

Ozette Lake sockeye salmon ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$0	$0	$0	$0	$0	$0
1702000504	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000505	$0	$0	$53,333	$53,333	$106,667	$106,667
1702000601	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000602	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000603	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000604	$0	$0	$53,333	$53,333	$106,667	$106,667
1702000605	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000806	$0	$0	$53,333	$53,333	$106,667	$106,667
1702000807	$0	$0	$26,667	$26,667	$53,333	$53,333
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$0	$0	$0	$0	$0	$0
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$0	$0	$26,667	$26,667	$53,333	$53,333

Upper Columbia River O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$0	$0	$0	$0	$0	$0
1702001204	$0	$0	$0	$0	$0	$0
1702001509	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$106,667	$106,667	$213,333	$213,333
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$106,667	$106,667	$213,333	$213,333
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$53,333	$53,333	$106,667	$106,667
1707010512	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010513	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000107	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$106,667	$106,667	$213,333	$213,333
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$0	$0	$0	$0	$0	$0
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$0	$0	$0	$0	$0	$0
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$0	$0	$0	$0
1706010406	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$0	$0	$0	$0	$0	$0
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$0	$0	$0	$0	$0	$0
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$0	$0	$0	$0	$0	$0
1706010501	$0	$0	$0	$0	$0	$0
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$0	$0	$0	$0	$0	$0
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$0	$0	$0	$0	$0	$0
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$0	$0	$0	$0	$0	$0
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$0	$0	$0	$0	$0	$0
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$0	$0	$0	$0	$0	$0
1706020104	$0	$0	$0	$0	$0	$0
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$0	$0	$0	$0	$0	$0
1706020113	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$0	$0	$0	$0	$0	$0
1706020117	$0	$0	$26,667	$26,667	$53,333	$53,333
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$0	$0	$0	$0	$0	$0
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$0	$0	$0	$0	$0	$0
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$0	$0	$0	$0	$0	$0
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$0	$0	$0	$0	$0	$0
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$0	$0	$0	$0
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$0	$0	$0	$0	$0	$0
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$0	$0	$0	$0	$0	$0
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$0	$0
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$0	$0	$0	$0	$0	$0
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$0	$0	$0	$0
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$0	$0	$0	$0	$0	$0
1706020912	$0	$0	$0	$0	$0	$0
1706020913	$0	$0	$0	$0	$0	$0
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$0	$0	$0	$0	$0	$0
1706021002	$0	$0	$0	$0	$0	$0
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$0	$0	$0	$0	$0	$0
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$0	$0	$0	$0	$0	$0
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$0	$0	$26,667	$26,667	$53,333	$53,333
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$0	$0	$0	$0	$0	$0
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$0	$0	$0	$0	$0	$0
1706030613	$0	$0	$0	$0	$0	$0
1706030614	$0	$0	$0	$0	$0	$0
1706030615	$0	$0	$0	$0	$0	$0
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$0	$0	$0	$0	$0	$0
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$0	$0	$0	$0	$0	$0
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$106,667	$106,667	$213,333	$213,333
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$53,333	$53,333	$106,667	$106,667
1707010512	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010513	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000107	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$0	$0	$0	$0	$0	$0
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010513	$0	$0	$26,667	$26,667	$53,333	$53,333
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$0	$0	$0	$0	$0	$0
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000105	$0	$0	$0	$0	$0	$0
1708000106	$0	$0	$80,000	$80,000	$160,000	$160,000
1708000107	$0	$0	$0	$0	$0	$0
1708000108	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000109	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000205	$0	$0	$53,333	$53,333	$106,667	$106,667
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$0	$0	$0	$0	$0	$0
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1709000704	$0	$0	$53,333	$53,333	$106,667	$106,667
1709001101	$0	$0	$0	$0	$0	$0
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$0	$0	$26,667	$26,667	$53,333	$53,333
1709001106	$0	$0	$133,333	$133,333	$266,667	$266,667
1709001201	$0	$0	$80,000	$80,000	$160,000	$160,000
1709001202	$0	$0	$26,667	$26,667	$53,333	$53,333
1709001203	$0	$0	$213,333	$213,333	$426,667	$426,667

Upper Willamette O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$0	$0	$0	$0	$0	$0
1709000304	$0	$0	$0	$0	$0	$0
1709000306	$0	$0	$0	$0	$0	$0
1709000504	$0	$0	$0	$0	$0	$0
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$0	$0	$0	$0	$0	$0
1709000601	$0	$0	$0	$0	$0	$0
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$0	$0	$26,667	$26,667	$53,333	$53,333
1709000702	$0	$0	$0	$0	$0	$0
1709000703	$0	$0	$53,333	$53,333	$106,667	$106,667
1709000704	$0	$0	$53,333	$53,333	$106,667	$106,667
1709000801	$0	$0	$0	$0	$0	$0
1709000802	$0	$0	$0	$0	$0	$0
1709000803	$0	$0	$0	$0	$0	$0
1709000804	$0	$0	$0	$0	$0	$0
1709000805	$0	$0	$0	$0	$0	$0
1709000806	$0	$0	$0	$0	$0	$0
1709000807	$0	$0	$0	$0	$0	$0
1709000901	$0	$0	$0	$0	$0	$0
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$0	$0	$0	$0	$0	$0
1709000904	$0	$0	$53,333	$53,333	$106,667	$106,667
1709000905	$0	$0	$0	$0	$0	$0
1709000906	$0	$0	$53,333	$53,333	$106,667	$106,667
1709001001	$0	$0	$0	$0	$0	$0
1709001002	$0	$0	$53,333	$53,333	$106,667	$106,667
1709001003	$0	$0	$0	$0	$0	$0
1709001004	$0	$0	$0	$0	$0	$0
1709001005	$0	$0	$133,333	$133,333	$266,667	$266,667
1709001201	$0	$0	$80,000	$80,000	$160,000	$160,000
1709001203	$0	$0	$213,333	$213,333	$426,667	$426,667

Middle Columbia River O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$106,667	$106,667	$213,333	$213,333
1703000101	$0	$0	$26,667	$26,667	$53,333	$53,333
1703000102	$0	$0	$0	$0	$0	$0
1703000103	$0	$0	$0	$0	$0	$0
1703000104	$0	$0	$0	$0	$0	$0
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$0	$0	$0	$0	$0	$0
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$0	$0	$26,667	$26,667	$53,333	$53,333
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$0	$0	$26,667	$26,667	$53,333	$53,333
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$0	$0	$0	$0	$0	$0
1703000307	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010101	$0	$0	$0	$0	$0	$0
1707010102	$0	$0	$0	$0	$0	$0
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$0	$0	$0	$0	$0	$0
1707010109	$0	$0	$0	$0	$0	$0
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$0	$0	$0	$0	$0	$0
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$106,667	$106,667	$213,333	$213,333
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$0	$0	$0	$0	$0	$0
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$0	$0	$0	$0	$0	$0
1707010209	$0	$0	$0	$0	$0	$0
1707010210	$0	$0	$0	$0	$0	$0
1707010211	$0	$0	$0	$0	$0	$0
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$0	$0	$0	$0	$0	$0
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$0	$0	$0	$0	$0	$0
1707010501	$0	$0	$0	$0	$0	$0
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$0	$0	$0	$0	$0	$0
1707010504	$0	$0	$53,333	$53,333	$106,667	$106,667
1707010505	$0	$0	$0	$0	$0	$0
1707010512	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010513	$0	$0	$26,667	$26,667	$53,333	$53,333
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$0	$0	$0	$0	$0	$0
1707010603	$0	$0	$0	$0	$0	$0
1707010604	$0	$0	$0	$0	$0	$0
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$0	$0	$0	$0
1707020111	$0	$0	$0	$0	$0	$0
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$0	$0	$0	$0	$0	$0
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$0	$0	$0	$0	$0	$0
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Mining Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$0	$0	$0	$0	$0	$0
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$26,667	$26,667	$53,333	$53,333
1707020411	$0	$0	$0	$0	$0	$0
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$0	$0	$0	$0	$0	$0
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$0	$0	$0	$0	$0	$0
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$26,667	$26,667	$53,333	$53,333
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$0	$0	$0	$0
1707030611	$0	$0	$26,667	$26,667	$53,333	$53,333
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$0	$0	$0	$0	$0	$0

Appendix F.12
Annual Development Impact by Watershed

Puget Sound chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711000201	$2,699	$2,699	$2,758	$2,758	$2,816	$2,816
1711000202	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1711000204	$0	$0	$0	$0	$0	$0
1711000401	$0	$0	$0	$0	$0	$0
1711000402	$0	$0	$0	$0	$0	$0
1711000403	$0	$0	$0	$0	$0	$0
1711000404	$0	$0	$0	$0	$0	$0
1711000405	$1,799	$1,799	$1,839	$1,839	$1,878	$1,878
1711000504	$0	$0	$0	$0	$0	$0
1711000505	$0	$0	$0	$0	$0	$0
1711000506	$0	$0	$0	$0	$0	$0
1711000507	$0	$0	$0	$0	$0	$0
1711000508	$0	$0	$0	$0	$0	$0
1711000601	$0	$0	$0	$0	$0	$0
1711000602	$0	$0	$0	$0	$0	$0
1711000603	$0	$0	$0	$0	$0	$0
1711000604	$0	$0	$0	$0	$0	$0
1711000701	$0	$0	$0	$0	$0	$0
1711000702	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1711000801	$0	$0	$0	$0	$0	$0
1711000802	$0	$0	$0	$0	$0	$0
1711000803	$0	$0	$0	$0	$0	$0
1711000901	$0	$0	$0	$0	$0	$0
1711000902	$0	$0	$0	$0	$0	$0
1711000903	$0	$0	$0	$0	$0	$0
1711000904	$0	$0	$0	$0	$0	$0
1711000905	$900	$900	$919	$919	$939	$939
1711001003	$900	$900	$919	$919	$939	$939
1711001004	$0	$0	$0	$0	$0	$0
1711001101	$0	$0	$0	$0	$0	$0
1711001102	$8,097	$8,097	$8,273	$8,273	$8,449	$8,449
1711001201	$2,699	$2,699	$2,758	$2,758	$2,816	$2,816
1711001202	$5,398	$5,398	$5,516	$5,516	$5,633	$5,633
1711001203	$1,799	$1,799	$1,839	$1,839	$1,878	$1,878
1711001204	$8,997	$8,997	$9,193	$9,193	$9,388	$9,388
1711001301	$900	$900	$919	$919	$939	$939

Puget Sound chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001302	$0	$0	$0	$0	$0	$0
1711001303	$8,097	$8,097	$8,273	$8,273	$8,449	$8,449
1711001401	$0	$0	$0	$0	$0	$0
1711001402	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1711001403	$0	$0	$0	$0	$0	$0
1711001404	$0	$0	$0	$0	$0	$0
1711001405	$1,799	$1,799	$1,839	$1,839	$1,878	$1,878
1711001502	$0	$0	$0	$0	$0	$0
1711001503	$900	$900	$919	$919	$939	$939
1711001601	$0	$0	$0	$0	$0	$0
1711001602	$900	$900	$919	$919	$939	$939
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001808	$900	$900	$919	$919	$939	$939
1711001900	$900	$900	$919	$919	$939	$939
1711001901	$4,499	$4,499	$4,596	$4,596	$4,694	$4,694
1711001902	$0	$0	$0	$0	$0	$0
1711001904	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1711002003	$0	$0	$0	$0	$0	$0
1711002004	$900	$900	$919	$919	$939	$939
1711002007	$0	$0	$0	$0	$0	$0
N01	$900	$900	$919	$919	$939	$939
N02	$0	$0	$0	$0	$0	$0
N03	$0	$0	$0	$0	$0	$0
N04	$0	$0	$0	$0	$0	$0
N05	$900	$900	$919	$919	$939	$939
N06	$0	$0	$0	$0	$0	$0
N07	$0	$0	$0	$0	$0	$0
N08	$0	$0	$0	$0	$0	$0
N09	$0	$0	$0	$0	$0	$0
N10	$0	$0	$0	$0	$0	$0
N11	$900	$900	$919	$919	$939	$939
N12	$0	$0	$0	$0	$0	$0
N13	$0	$0	$0	$0	$0	$0
N14	$900	$900	$919	$919	$939	$939
N15	$900	$900	$919	$919	$939	$939

Puget Sound chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$3,382	$3,382	$3,456	$3,456	$3,529	$3,529
1707010509	$0	$0	$0	$0	$0	$0
1707010510	$0	$0	$0	$0	$0	$0
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0
1708000102	$676	$676	$691	$691	$706	$706
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1708000105	$676	$676	$691	$691	$706	$706
1708000106	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1708000107	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1708000108	$12,176	$12,176	$12,441	$12,441	$12,706	$12,706
1708000109	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1708000205	$900	$900	$919	$919	$939	$939
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$900	$900	$919	$919	$939	$939
1708000302	$4,059	$4,059	$4,147	$4,147	$4,235	$4,235
1708000303	$0	$0	$0	$0	$0	$0
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000306	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0

Lower Columbia River chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1708000601	$4,059	$4,059	$4,147	$4,147	$4,235	$4,235
1708000602	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1708000603	$0	$0	$0	$0	$0	$0
1709000704	$27,059	$27,059	$27,647	$27,647	$28,235	$28,235
1709001105	$676	$676	$691	$691	$706	$706
1709001106	$21,647	$21,647	$22,118	$22,118	$22,588	$22,588
1709001201	$29,765	$29,765	$30,412	$30,412	$31,059	$31,059
1709001202	$10,824	$10,824	$11,059	$11,059	$11,294	$11,294
1709001203	$43,971	$43,971	$44,926	$44,926	$45,882	$45,882

Upper Willamette River chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000101	$0	$0	$0	$0	$0	$0
1709000102	$0	$0	$0	$0	$0	$0
1709000103	$0	$0	$0	$0	$0	$0
1709000104	$676	$676	$691	$691	$706	$706
1709000105	$0	$0	$0	$0	$0	$0
1709000106	$0	$0	$0	$0	$0	$0
1709000107	$676	$676	$691	$691	$706	$706
1709000108	$0	$0	$0	$0	$0	$0
1709000109	$0	$0	$0	$0	$0	$0
1709000110	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000201	$676	$676	$691	$691	$706	$706
1709000202	$0	$0	$0	$0	$0	$0
1709000203	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1709000205	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1709000301	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000302	$21,647	$21,647	$22,118	$22,118	$22,588	$22,588
1709000303	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412

Upper Willamette River chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000304	$14,206	$14,206	$14,515	$14,515	$14,824	$14,824
1709000305	$12,176	$12,176	$12,441	$12,441	$12,706	$12,706
1709000306	$676	$676	$691	$691	$706	$706
1709000401	$0	$0	$0	$0	$0	$0
1709000402	$0	$0	$0	$0	$0	$0
1709000403	$676	$676	$691	$691	$706	$706
1709000404	$0	$0	$0	$0	$0	$0
1709000405	$0	$0	$0	$0	$0	$0
1709000406	$0	$0	$0	$0	$0	$0
1709000407	$4,735	$4,735	$4,838	$4,838	$4,941	$4,941
1709000504	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000601	$4,735	$4,735	$4,838	$4,838	$4,941	$4,941
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$15,559	$15,559	$15,897	$15,897	$16,235	$16,235
1709000702	$10,824	$10,824	$11,059	$11,059	$11,294	$11,294
1709000703	$42,618	$42,618	$43,544	$43,544	$44,471	$44,471
1709000704	$27,059	$27,059	$27,647	$27,647	$28,235	$28,235
1709000804	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1709000805	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000806	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1709000807	$9,471	$9,471	$9,676	$9,676	$9,882	$9,882
1709000901	$6,088	$6,088	$6,221	$6,221	$6,353	$6,353
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$4,735	$4,735	$4,838	$4,838	$4,941	$4,941
1709000904	$9,471	$9,471	$9,676	$9,676	$9,882	$9,882
1709000905	$676	$676	$691	$691	$706	$706
1709000906	$3,382	$3,382	$3,456	$3,456	$3,529	$3,529
1709001101	$676	$676	$691	$691	$706	$706
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$676	$676	$691	$691	$706	$706
1709001106	$21,647	$21,647	$22,118	$22,118	$22,588	$22,588
1709001201	$29,765	$29,765	$30,412	$30,412	$31,059	$31,059

Upper Willamette River chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709001203	$43,971	$43,971	$44,926	$44,926	$45,882	$45,882

Upper Columbia River spring-run chinook salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000505	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$900	$900	$919	$919	$939	$939
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$0	$0	$0	$0	$0	$0
1702001105	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$900	$900	$919	$919	$939	$939
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$676	$676	$691	$691	$706	$706
1707010512	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412

Oregon Coast coho salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020101	$3,382	$3,382	$3,456	$3,456	$3,529	$3,529
1710020201	$0	$0	$0	$0	$0	$0
1710020202	$676	$676	$691	$691	$706	$706
1710020203	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710020204	$676	$676	$691	$691	$706	$706
1710020205	$676	$676	$691	$691	$706	$706
1710020206	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710020301	$676	$676	$691	$691	$706	$706
1710020302	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710020303	$0	$0	$0	$0	$0	$0
1710020304	$3,382	$3,382	$3,456	$3,456	$3,529	$3,529
1710020305	$676	$676	$691	$691	$706	$706
1710020306	$676	$676	$691	$691	$706	$706
1710020307	$0	$0	$0	$0	$0	$0
1710020308	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710020309	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1710020401	$0	$0	$0	$0	$0	$0
1710020402	$0	$0	$0	$0	$0	$0
1710020403	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710020405	$0	$0	$0	$0	$0	$0
1710020406	$0	$0	$0	$0	$0	$0
1710020407	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1710020408	$676	$676	$691	$691	$706	$706
1710020409	$4,059	$4,059	$4,147	$4,147	$4,235	$4,235
1710020501	$676	$676	$691	$691	$706	$706
1710020502	$0	$0	$0	$0	$0	$0
1710020503	$0	$0	$0	$0	$0	$0
1710020504	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1710020505	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710020506	$0	$0	$0	$0	$0	$0
1710020507	$0	$0	$0	$0	$0	$0
1710020508	$0	$0	$0	$0	$0	$0
1710020601	$0	$0	$0	$0	$0	$0
1710020602	$0	$0	$0	$0	$0	$0
1710020603	$0	$0	$0	$0	$0	$0
1710020604	$0	$0	$0	$0	$0	$0
1710020605	$0	$0	$0	$0	$0	$0
1710020606	$0	$0	$0	$0	$0	$0
1710020607	$0	$0	$0	$0	$0	$0
1710020608	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118

Oregon Coast coho salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710020701	$0	$0	$0	$0	$0	$0
1710030106	$0	$0	$0	$0	$0	$0
1710030107	$0	$0	$0	$0	$0	$0
1710030108	$0	$0	$0	$0	$0	$0
1710030109	$0	$0	$0	$0	$0	$0
1710030110	$0	$0	$0	$0	$0	$0
1710030111	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1710030112	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1710030201	$0	$0	$0	$0	$0	$0
1710030202	$0	$0	$0	$0	$0	$0
1710030203	$0	$0	$0	$0	$0	$0
1710030204	$0	$0	$0	$0	$0	$0
1710030205	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1710030207	$0	$0	$0	$0	$0	$0
1710030208	$0	$0	$0	$0	$0	$0
1710030209	$676	$676	$691	$691	$706	$706
1710030210	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710030211	$0	$0	$0	$0	$0	$0
1710030212	$676	$676	$691	$691	$706	$706
1710030213	$6,088	$6,088	$6,221	$6,221	$6,353	$6,353
1710030301	$0	$0	$0	$0	$0	$0
1710030302	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1710030303	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1710030304	$0	$0	$0	$0	$0	$0
1710030305	$0	$0	$0	$0	$0	$0
1710030306	$0	$0	$0	$0	$0	$0
1710030307	$0	$0	$0	$0	$0	$0
1710030308	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710030401	$0	$0	$0	$0	$0	$0
1710030402	$0	$0	$0	$0	$0	$0
1710030403	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1710030404	$10,824	$10,824	$11,059	$11,059	$11,294	$11,294
1710030501	$0	$0	$0	$0	$0	$0
1710030502	$676	$676	$691	$691	$706	$706
1710030503	$0	$0	$0	$0	$0	$0
1710030504	$0	$0	$0	$0	$0	$0
1710030505	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1710030506	$4,059	$4,059	$4,147	$4,147	$4,235	$4,235
1710030603	$676	$676	$691	$691	$706	$706
1710030604	$5,412	$5,412	$5,529	$5,529	$5,647	$5,647

Hood Canal Summer-run chum salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1711001701	$0	$0	$0	$0	$0	$0
1711001802	$0	$0	$0	$0	$0	$0
1711001803	$0	$0	$0	$0	$0	$0
1711001804	$0	$0	$0	$0	$0	$0
1711001805	$0	$0	$0	$0	$0	$0
1711001806	$0	$0	$0	$0	$0	$0
1711001807	$0	$0	$0	$0	$0	$0
1711001808	$900	$900	$919	$919	$939	$939
1711001908	$0	$0	$0	$0	$0	$0
1711002001	$0	$0	$0	$0	$0	$0
1711002002	$0	$0	$0	$0	$0	$0
1711002003	$0	$0	$0	$0	$0	$0
N15	$900	$900	$919	$919	$939	$939
N16	$0	$0	$0	$0	$0	$0
N17	$0	$0	$0	$0	$0	$0
N18	$0	$0	$0	$0	$0	$0
N19	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010509	$0	$0	$0	$0	$0	$0
1707010512	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1707010513	$0	$0	$0	$0	$0	$0
1708000106	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1708000107	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1708000109	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1708000205	$900	$900	$919	$919	$939	$939
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$900	$900	$919	$919	$939	$939
1708000304	$0	$0	$0	$0	$0	$0
1708000305	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0

Columbia River chum salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000602	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1708000603	$0	$0	$0	$0	$0	$0

Ozette Lake sockeye salmon ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1710010102	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702000503	$0	$0	$0	$0	$0	$0
1702000504	$0	$0	$0	$0	$0	$0
1702000505	$0	$0	$0	$0	$0	$0
1702000601	$0	$0	$0	$0	$0	$0
1702000602	$900	$900	$919	$919	$939	$939
1702000603	$0	$0	$0	$0	$0	$0
1702000604	$0	$0	$0	$0	$0	$0
1702000605	$0	$0	$0	$0	$0	$0
1702000704	$0	$0	$0	$0	$0	$0
1702000801	$0	$0	$0	$0	$0	$0
1702000802	$0	$0	$0	$0	$0	$0
1702000803	$0	$0	$0	$0	$0	$0
1702000804	$0	$0	$0	$0	$0	$0
1702000805	$0	$0	$0	$0	$0	$0
1702000806	$0	$0	$0	$0	$0	$0
1702000807	$0	$0	$0	$0	$0	$0
1702000903	$0	$0	$0	$0	$0	$0
1702001001	$0	$0	$0	$0	$0	$0
1702001002	$900	$900	$919	$919	$939	$939
1702001003	$0	$0	$0	$0	$0	$0
1702001004	$0	$0	$0	$0	$0	$0
1702001101	$0	$0	$0	$0	$0	$0
1702001102	$0	$0	$0	$0	$0	$0
1702001103	$0	$0	$0	$0	$0	$0
1702001104	$0	$0	$0	$0	$0	$0

Upper Columbia River O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001105	$0	$0	$0	$0	$0	$0
1702001204	$0	$0	$0	$0	$0	$0
1702001509	$0	$0	$0	$0	$0	$0
1702001604	$0	$0	$0	$0	$0	$0
1702001605	$0	$0	$0	$0	$0	$0
1702001606	$0	$0	$0	$0	$0	$0
1707010101	$900	$900	$919	$919	$939	$939
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$676	$676	$691	$691	$706	$706
1707010512	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1706010101	$0	$0	$0	$0	$0	$0
1706010102	$0	$0	$0	$0	$0	$0
1706010104	$0	$0	$0	$0	$0	$0
1706010201	$0	$0	$0	$0	$0	$0
1706010202	$0	$0	$0	$0	$0	$0
1706010203	$0	$0	$0	$0	$0	$0
1706010204	$0	$0	$0	$0	$0	$0
1706010205	$0	$0	$0	$0	$0	$0
1706010301	$0	$0	$0	$0	$0	$0
1706010302	$0	$0	$0	$0	$0	$0
1706010303	$14,422	$14,422	$14,736	$14,736	$15,049	$15,049
1706010401	$0	$0	$0	$0	$0	$0
1706010402	$0	$0	$0	$0	$0	$0
1706010403	$676	$676	$691	$691	$706	$706
1706010404	$0	$0	$0	$0	$0	$0
1706010405	$0	$0	$0	$0	$0	$0
1706010406	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706010407	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1706010408	$0	$0	$0	$0	$0	$0
1706010409	$0	$0	$0	$0	$0	$0
1706010410	$0	$0	$0	$0	$0	$0
1706010411	$0	$0	$0	$0	$0	$0
1706010501	$0	$0	$0	$0	$0	$0
1706010502	$0	$0	$0	$0	$0	$0
1706010503	$0	$0	$0	$0	$0	$0
1706010504	$0	$0	$0	$0	$0	$0
1706010505	$0	$0	$0	$0	$0	$0
1706010506	$0	$0	$0	$0	$0	$0
1706010601	$0	$0	$0	$0	$0	$0
1706010602	$0	$0	$0	$0	$0	$0
1706010603	$0	$0	$0	$0	$0	$0
1706010604	$0	$0	$0	$0	$0	$0
1706010605	$0	$0	$0	$0	$0	$0
1706010606	$0	$0	$0	$0	$0	$0
1706010607	$0	$0	$0	$0	$0	$0
1706010701	$0	$0	$0	$0	$0	$0
1706010702	$0	$0	$0	$0	$0	$0
1706010703	$0	$0	$0	$0	$0	$0
1706010704	$3,606	$3,606	$3,684	$3,684	$3,762	$3,762
1706010705	$0	$0	$0	$0	$0	$0
1706010706	$0	$0	$0	$0	$0	$0
1706010707	$0	$0	$0	$0	$0	$0
1706010708	$0	$0	$0	$0	$0	$0
1706010808	$0	$0	$0	$0	$0	$0
1706011001	$0	$0	$0	$0	$0	$0
1706011003	$0	$0	$0	$0	$0	$0
1706011004	$0	$0	$0	$0	$0	$0
1706020101	$0	$0	$0	$0	$0	$0
1706020104	$0	$0	$0	$0	$0	$0
1706020105	$0	$0	$0	$0	$0	$0
1706020107	$0	$0	$0	$0	$0	$0
1706020108	$0	$0	$0	$0	$0	$0
1706020109	$0	$0	$0	$0	$0	$0
1706020110	$0	$0	$0	$0	$0	$0
1706020111	$0	$0	$0	$0	$0	$0
1706020112	$0	$0	$0	$0	$0	$0
1706020113	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020114	$0	$0	$0	$0	$0	$0
1706020115	$0	$0	$0	$0	$0	$0
1706020117	$0	$0	$0	$0	$0	$0
1706020118	$0	$0	$0	$0	$0	$0
1706020119	$0	$0	$0	$0	$0	$0
1706020120	$0	$0	$0	$0	$0	$0
1706020121	$0	$0	$0	$0	$0	$0
1706020122	$0	$0	$0	$0	$0	$0
1706020123	$0	$0	$0	$0	$0	$0
1706020124	$0	$0	$0	$0	$0	$0
1706020125	$0	$0	$0	$0	$0	$0
1706020126	$0	$0	$0	$0	$0	$0
1706020127	$0	$0	$0	$0	$0	$0
1706020128	$0	$0	$0	$0	$0	$0
1706020129	$0	$0	$0	$0	$0	$0
1706020130	$0	$0	$0	$0	$0	$0
1706020132	$0	$0	$0	$0	$0	$0
1706020201	$0	$0	$0	$0	$0	$0
1706020202	$0	$0	$0	$0	$0	$0
1706020203	$0	$0	$0	$0	$0	$0
1706020301	$0	$0	$0	$0	$0	$0
1706020302	$0	$0	$0	$0	$0	$0
1706020303	$0	$0	$0	$0	$0	$0
1706020304	$0	$0	$0	$0	$0	$0
1706020305	$0	$0	$0	$0	$0	$0
1706020306	$0	$0	$0	$0	$0	$0
1706020307	$0	$0	$0	$0	$0	$0
1706020308	$0	$0	$0	$0	$0	$0
1706020309	$0	$0	$0	$0	$0	$0
1706020310	$0	$0	$0	$0	$0	$0
1706020311	$0	$0	$0	$0	$0	$0
1706020312	$0	$0	$0	$0	$0	$0
1706020313	$0	$0	$0	$0	$0	$0
1706020314	$0	$0	$0	$0	$0	$0
1706020315	$0	$0	$0	$0	$0	$0
1706020316	$0	$0	$0	$0	$0	$0
1706020317	$0	$0	$0	$0	$0	$0
1706020318	$0	$0	$0	$0	$0	$0
1706020319	$0	$0	$0	$0	$0	$0
1706020320	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020321	$0	$0	$0	$0	$0	$0
1706020322	$0	$0	$0	$0	$0	$0
1706020323	$0	$0	$0	$0	$0	$0
1706020401	$0	$0	$0	$0	$0	$0
1706020402	$0	$0	$0	$0	$0	$0
1706020403	$0	$0	$0	$0	$0	$0
1706020404	$0	$0	$0	$0	$0	$0
1706020405	$0	$0	$0	$0	$0	$0
1706020406	$0	$0	$0	$0	$0	$0
1706020407	$0	$0	$0	$0	$0	$0
1706020408	$0	$0	$0	$0	$0	$0
1706020409	$0	$0	$0	$0	$0	$0
1706020414	$0	$0	$0	$0	$0	$0
1706020501	$0	$0	$0	$0	$0	$0
1706020502	$0	$0	$0	$0	$0	$0
1706020503	$0	$0	$0	$0	$0	$0
1706020504	$0	$0	$0	$0	$0	$0
1706020505	$0	$0	$0	$0	$0	$0
1706020506	$0	$0	$0	$0	$0	$0
1706020507	$0	$0	$0	$0	$0	$0
1706020508	$0	$0	$0	$0	$0	$0
1706020509	$0	$0	$0	$0	$0	$0
1706020510	$0	$0	$0	$0	$0	$0
1706020511	$0	$0	$0	$0	$0	$0
1706020512	$0	$0	$0	$0	$0	$0
1706020513	$0	$0	$0	$0	$0	$0
1706020601	$0	$0	$0	$0	$0	$0
1706020602	$0	$0	$0	$0	$0	$0
1706020603	$0	$0	$0	$0	$0	$0
1706020604	$0	$0	$0	$0	$0	$0
1706020605	$0	$0	$0	$0	$0	$0
1706020606	$0	$0	$0	$0	$0	$0
1706020607	$0	$0	$0	$0	$0	$0
1706020608	$0	$0	$0	$0	$0	$0
1706020609	$0	$0	$0	$0	$0	$0
1706020610	$0	$0	$0	$0	$0	$0
1706020611	$0	$0	$0	$0	$0	$0
1706020612	$0	$0	$0	$0	$0	$0
1706020613	$0	$0	$0	$0	$0	$0
1706020614	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020615	$0	$0	$0	$0	$0	$0
1706020616	$0	$0	$0	$0	$0	$0
1706020617	$0	$0	$0	$0	$0	$0
1706020701	$0	$0	$0	$0	$0	$0
1706020702	$0	$0	$0	$0	$0	$0
1706020703	$0	$0	$0	$0	$0	$0
1706020704	$0	$0	$0	$0	$0	$0
1706020705	$0	$0	$0	$0	$0	$0
1706020706	$0	$0	$0	$0	$0	$0
1706020707	$0	$0	$0	$0	$0	$0
1706020708	$0	$0	$0	$0	$0	$0
1706020709	$0	$0	$0	$0	$0	$0
1706020710	$0	$0	$0	$0	$0	$0
1706020711	$0	$0	$0	$0	$0	$0
1706020712	$0	$0	$0	$0	$0	$0
1706020713	$0	$0	$0	$0	$0	$0
1706020714	$0	$0	$0	$0	$0	$0
1706020715	$0	$0	$0	$0	$0	$0
1706020716	$0	$0	$0	$0	$0	$0
1706020717	$0	$0	$0	$0	$0	$0
1706020718	$0	$0	$0	$0	$0	$0
1706020719	$0	$0	$0	$0	$0	$0
1706020801	$0	$0	$0	$0	$0	$0
1706020802	$0	$0	$0	$0	$0	$0
1706020803	$0	$0	$0	$0	$0	$0
1706020804	$0	$0	$0	$0	$0	$0
1706020805	$0	$0	$0	$0	$0	$0
1706020806	$0	$0	$0	$0	$0	$0
1706020807	$0	$0	$0	$0	$0	$0
1706020808	$0	$0	$0	$0	$0	$0
1706020809	$0	$0	$0	$0	$0	$0
1706020810	$0	$0	$0	$0	$0	$0
1706020811	$0	$0	$0	$0	$0	$0
1706020812	$0	$0	$0	$0	$0	$0
1706020813	$0	$0	$0	$0	$0	$0
1706020814	$0	$0	$0	$0	$0	$0
1706020815	$0	$0	$0	$0	$0	$0
1706020901	$0	$0	$0	$0	$0	$0
1706020902	$0	$0	$0	$0	$0	$0
1706020903	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706020904	$0	$0	$0	$0	$0	$0
1706020905	$0	$0	$0	$0	$0	$0
1706020906	$0	$0	$0	$0	$0	$0
1706020907	$0	$0	$0	$0	$0	$0
1706020908	$0	$0	$0	$0	$0	$0
1706020909	$0	$0	$0	$0	$0	$0
1706020910	$0	$0	$0	$0	$0	$0
1706020911	$3,606	$3,606	$3,684	$3,684	$3,762	$3,762
1706020912	$0	$0	$0	$0	$0	$0
1706020913	$0	$0	$0	$0	$0	$0
1706020914	$0	$0	$0	$0	$0	$0
1706020915	$0	$0	$0	$0	$0	$0
1706020916	$0	$0	$0	$0	$0	$0
1706020917	$0	$0	$0	$0	$0	$0
1706021001	$0	$0	$0	$0	$0	$0
1706021002	$0	$0	$0	$0	$0	$0
1706021003	$0	$0	$0	$0	$0	$0
1706021006	$0	$0	$0	$0	$0	$0
1706021007	$0	$0	$0	$0	$0	$0
1706030101	$0	$0	$0	$0	$0	$0
1706030102	$0	$0	$0	$0	$0	$0
1706030103	$0	$0	$0	$0	$0	$0
1706030104	$0	$0	$0	$0	$0	$0
1706030105	$0	$0	$0	$0	$0	$0
1706030106	$0	$0	$0	$0	$0	$0
1706030107	$0	$0	$0	$0	$0	$0
1706030108	$0	$0	$0	$0	$0	$0
1706030109	$0	$0	$0	$0	$0	$0
1706030201	$0	$0	$0	$0	$0	$0
1706030202	$0	$0	$0	$0	$0	$0
1706030203	$0	$0	$0	$0	$0	$0
1706030204	$0	$0	$0	$0	$0	$0
1706030205	$0	$0	$0	$0	$0	$0
1706030207	$0	$0	$0	$0	$0	$0
1706030208	$0	$0	$0	$0	$0	$0
1706030209	$0	$0	$0	$0	$0	$0
1706030210	$0	$0	$0	$0	$0	$0
1706030211	$0	$0	$0	$0	$0	$0
1706030212	$0	$0	$0	$0	$0	$0
1706030213	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030214	$0	$0	$0	$0	$0	$0
1706030301	$0	$0	$0	$0	$0	$0
1706030302	$0	$0	$0	$0	$0	$0
1706030303	$0	$0	$0	$0	$0	$0
1706030304	$0	$0	$0	$0	$0	$0
1706030305	$0	$0	$0	$0	$0	$0
1706030306	$0	$0	$0	$0	$0	$0
1706030307	$0	$0	$0	$0	$0	$0
1706030308	$0	$0	$0	$0	$0	$0
1706030309	$0	$0	$0	$0	$0	$0
1706030310	$0	$0	$0	$0	$0	$0
1706030311	$0	$0	$0	$0	$0	$0
1706030312	$0	$0	$0	$0	$0	$0
1706030313	$0	$0	$0	$0	$0	$0
1706030314	$0	$0	$0	$0	$0	$0
1706030401	$0	$0	$0	$0	$0	$0
1706030402	$0	$0	$0	$0	$0	$0
1706030501	$0	$0	$0	$0	$0	$0
1706030502	$0	$0	$0	$0	$0	$0
1706030503	$0	$0	$0	$0	$0	$0
1706030504	$0	$0	$0	$0	$0	$0
1706030505	$0	$0	$0	$0	$0	$0
1706030506	$0	$0	$0	$0	$0	$0
1706030507	$0	$0	$0	$0	$0	$0
1706030508	$0	$0	$0	$0	$0	$0
1706030509	$0	$0	$0	$0	$0	$0
1706030510	$0	$0	$0	$0	$0	$0
1706030511	$0	$0	$0	$0	$0	$0
1706030512	$0	$0	$0	$0	$0	$0
1706030513	$0	$0	$0	$0	$0	$0
1706030601	$0	$0	$0	$0	$0	$0
1706030602	$0	$0	$0	$0	$0	$0
1706030603	$0	$0	$0	$0	$0	$0
1706030604	$0	$0	$0	$0	$0	$0
1706030606	$0	$0	$0	$0	$0	$0
1706030607	$0	$0	$0	$0	$0	$0
1706030608	$0	$0	$0	$0	$0	$0
1706030609	$0	$0	$0	$0	$0	$0
1706030610	$0	$0	$0	$0	$0	$0
1706030611	$0	$0	$0	$0	$0	$0

Snake River Basin O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1706030612	$3,606	$3,606	$3,684	$3,684	$3,762	$3,762
1706030613	$3,606	$3,606	$3,684	$3,684	$3,762	$3,762
1706030614	$7,211	$7,211	$7,368	$7,368	$7,525	$7,525
1706030615	$0	$0	$0	$0	$0	$0
1706030616	$0	$0	$0	$0	$0	$0
1706030617	$0	$0	$0	$0	$0	$0
1706030618	$0	$0	$0	$0	$0	$0
1706030619	$0	$0	$0	$0	$0	$0
1706030620	$0	$0	$0	$0	$0	$0
1706030621	$0	$0	$0	$0	$0	$0
1706030622	$0	$0	$0	$0	$0	$0
1706030623	$0	$0	$0	$0	$0	$0
1706030624	$0	$0	$0	$0	$0	$0
1706030627	$0	$0	$0	$0	$0	$0
1706030630	$0	$0	$0	$0	$0	$0
1706030631	$0	$0	$0	$0	$0	$0
1706030801	$0	$0	$0	$0	$0	$0
1707010101	$900	$900	$919	$919	$939	$939
1707010102	$0	$0	$0	$0	$0	$0
1707010106	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707010109	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010501	$0	$0	$0	$0	$0	$0
1707010504	$676	$676	$691	$691	$706	$706
1707010512	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1707010513	$0	$0	$0	$0	$0	$0
1708000107	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412

Lower Columbia River O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010506	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707010507	$0	$0	$0	$0	$0	$0
1707010508	$3,382	$3,382	$3,456	$3,456	$3,529	$3,529
1707010511	$0	$0	$0	$0	$0	$0
1707010512	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1707010513	$0	$0	$0	$0	$0	$0
1708000101	$0	$0	$0	$0	$0	$0

Lower Columbia River O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1708000102	$676	$676	$691	$691	$706	$706
1708000103	$0	$0	$0	$0	$0	$0
1708000104	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1708000105	$676	$676	$691	$691	$706	$706
1708000106	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1708000107	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1708000108	$12,176	$12,176	$12,441	$12,441	$12,706	$12,706
1708000109	$3,599	$3,599	$3,677	$3,677	$3,755	$3,755
1708000205	$900	$900	$919	$919	$939	$939
1708000206	$0	$0	$0	$0	$0	$0
1708000301	$900	$900	$919	$919	$939	$939
1708000401	$0	$0	$0	$0	$0	$0
1708000402	$0	$0	$0	$0	$0	$0
1708000403	$0	$0	$0	$0	$0	$0
1708000404	$0	$0	$0	$0	$0	$0
1708000405	$0	$0	$0	$0	$0	$0
1708000501	$0	$0	$0	$0	$0	$0
1708000502	$0	$0	$0	$0	$0	$0
1708000503	$0	$0	$0	$0	$0	$0
1708000504	$0	$0	$0	$0	$0	$0
1708000505	$0	$0	$0	$0	$0	$0
1708000506	$0	$0	$0	$0	$0	$0
1708000507	$0	$0	$0	$0	$0	$0
1708000508	$0	$0	$0	$0	$0	$0
1709000704	$27,059	$27,059	$27,647	$27,647	$28,235	$28,235
1709001101	$676	$676	$691	$691	$706	$706
1709001102	$0	$0	$0	$0	$0	$0
1709001103	$0	$0	$0	$0	$0	$0
1709001104	$0	$0	$0	$0	$0	$0
1709001105	$676	$676	$691	$691	$706	$706
1709001106	$21,647	$21,647	$22,118	$22,118	$22,588	$22,588
1709001201	$29,765	$29,765	$30,412	$30,412	$31,059	$31,059
1709001202	$10,824	$10,824	$11,059	$11,059	$11,294	$11,294
1709001203	$43,971	$43,971	$44,926	$44,926	$45,882	$45,882

Upper Willamette O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1709000303	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1709000304	$14,206	$14,206	$14,515	$14,515	$14,824	$14,824
1709000306	$676	$676	$691	$691	$706	$706
1709000504	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000505	$0	$0	$0	$0	$0	$0
1709000506	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000601	$4,735	$4,735	$4,838	$4,838	$4,941	$4,941
1709000602	$0	$0	$0	$0	$0	$0
1709000603	$0	$0	$0	$0	$0	$0
1709000606	$0	$0	$0	$0	$0	$0
1709000607	$0	$0	$0	$0	$0	$0
1709000608	$0	$0	$0	$0	$0	$0
1709000701	$15,559	$15,559	$15,897	$15,897	$16,235	$16,235
1709000702	$10,824	$10,824	$11,059	$11,059	$11,294	$11,294
1709000703	$42,618	$42,618	$43,544	$43,544	$44,471	$44,471
1709000704	$27,059	$27,059	$27,647	$27,647	$28,235	$28,235
1709000801	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000802	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000803	$676	$676	$691	$691	$706	$706
1709000804	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1709000805	$2,029	$2,029	$2,074	$2,074	$2,118	$2,118
1709000806	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1709000807	$9,471	$9,471	$9,676	$9,676	$9,882	$9,882
1709000901	$6,088	$6,088	$6,221	$6,221	$6,353	$6,353
1709000902	$0	$0	$0	$0	$0	$0
1709000903	$4,735	$4,735	$4,838	$4,838	$4,941	$4,941
1709000904	$9,471	$9,471	$9,676	$9,676	$9,882	$9,882
1709000905	$676	$676	$691	$691	$706	$706
1709000906	$3,382	$3,382	$3,456	$3,456	$3,529	$3,529
1709001001	$14,882	$14,882	$15,206	$15,206	$15,529	$15,529
1709001002	$4,735	$4,735	$4,838	$4,838	$4,941	$4,941
1709001003	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1709001004	$56,147	$56,147	$57,368	$57,368	$58,588	$58,588
1709001005	$39,235	$39,235	$40,088	$40,088	$40,941	$40,941
1709001201	$29,765	$29,765	$30,412	$30,412	$31,059	$31,059
1709001203	$43,971	$43,971	$44,926	$44,926	$45,882	$45,882

Middle Columbia River O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1702001606	$0	$0	$0	$0	$0	$0
1703000101	$0	$0	$0	$0	$0	$0
1703000102	$0	$0	$0	$0	$0	$0
1703000103	$1,799	$1,799	$1,839	$1,839	$1,878	$1,878
1703000104	$0	$0	$0	$0	$0	$0
1703000201	$0	$0	$0	$0	$0	$0
1703000202	$0	$0	$0	$0	$0	$0
1703000203	$0	$0	$0	$0	$0	$0
1703000301	$0	$0	$0	$0	$0	$0
1703000302	$0	$0	$0	$0	$0	$0
1703000303	$0	$0	$0	$0	$0	$0
1703000304	$0	$0	$0	$0	$0	$0
1703000305	$0	$0	$0	$0	$0	$0
1703000306	$900	$900	$919	$919	$939	$939
1703000307	$900	$900	$919	$919	$939	$939
1707010101	$900	$900	$919	$919	$939	$939
1707010102	$0	$0	$0	$0	$0	$0
1707010105	$0	$0	$0	$0	$0	$0
1707010106	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707010109	$0	$0	$0	$0	$0	$0
1707010110	$0	$0	$0	$0	$0	$0
1707010111	$0	$0	$0	$0	$0	$0
1707010112	$0	$0	$0	$0	$0	$0
1707010113	$0	$0	$0	$0	$0	$0
1707010114	$0	$0	$0	$0	$0	$0
1707010201	$0	$0	$0	$0	$0	$0
1707010202	$900	$900	$919	$919	$939	$939
1707010203	$0	$0	$0	$0	$0	$0
1707010204	$0	$0	$0	$0	$0	$0
1707010207	$0	$0	$0	$0	$0	$0
1707010208	$676	$676	$691	$691	$706	$706
1707010209	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707010210	$0	$0	$0	$0	$0	$0
1707010211	$0	$0	$0	$0	$0	$0
1707010301	$0	$0	$0	$0	$0	$0
1707010302	$0	$0	$0	$0	$0	$0
1707010303	$3,382	$3,382	$3,456	$3,456	$3,529	$3,529
1707010304	$0	$0	$0	$0	$0	$0
1707010305	$0	$0	$0	$0	$0	$0
1707010306	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707010307	$0	$0	$0	$0	$0	$0
1707010308	$0	$0	$0	$0	$0	$0
1707010310	$0	$0	$0	$0	$0	$0
1707010313	$676	$676	$691	$691	$706	$706
1707010501	$0	$0	$0	$0	$0	$0
1707010502	$0	$0	$0	$0	$0	$0
1707010503	$0	$0	$0	$0	$0	$0
1707010504	$676	$676	$691	$691	$706	$706
1707010505	$0	$0	$0	$0	$0	$0
1707010512	$2,706	$2,706	$2,765	$2,765	$2,824	$2,824
1707010513	$0	$0	$0	$0	$0	$0
1707010601	$0	$0	$0	$0	$0	$0
1707010602	$0	$0	$0	$0	$0	$0
1707010603	$0	$0	$0	$0	$0	$0
1707010604	$0	$0	$0	$0	$0	$0
1707020103	$0	$0	$0	$0	$0	$0
1707020104	$0	$0	$0	$0	$0	$0
1707020105	$0	$0	$0	$0	$0	$0
1707020106	$0	$0	$0	$0	$0	$0
1707020107	$0	$0	$0	$0	$0	$0
1707020108	$0	$0	$0	$0	$0	$0
1707020109	$0	$0	$0	$0	$0	$0
1707020110	$0	$0	$0	$0	$0	$0
1707020111	$676	$676	$691	$691	$706	$706
1707020112	$0	$0	$0	$0	$0	$0
1707020113	$0	$0	$0	$0	$0	$0
1707020114	$0	$0	$0	$0	$0	$0
1707020115	$676	$676	$691	$691	$706	$706
1707020201	$0	$0	$0	$0	$0	$0
1707020202	$0	$0	$0	$0	$0	$0
1707020203	$0	$0	$0	$0	$0	$0
1707020204	$0	$0	$0	$0	$0	$0
1707020205	$0	$0	$0	$0	$0	$0
1707020206	$0	$0	$0	$0	$0	$0
1707020207	$0	$0	$0	$0	$0	$0
1707020208	$0	$0	$0	$0	$0	$0
1707020209	$0	$0	$0	$0	$0	$0
1707020210	$0	$0	$0	$0	$0	$0
1707020301	$0	$0	$0	$0	$0	$0
1707020302	$0	$0	$0	$0	$0	$0

Middle Columbia River O. mykiss ESU						
Watershed	Annual Development Impact Cost Estimate and Discount Rate					
	Low - 3%	Low - 7%	Mid - 3%	Mid - 7%	High - 3%	High - 7%
1707020303	$0	$0	$0	$0	$0	$0
1707020304	$0	$0	$0	$0	$0	$0
1707020305	$0	$0	$0	$0	$0	$0
1707020401	$0	$0	$0	$0	$0	$0
1707020402	$0	$0	$0	$0	$0	$0
1707020403	$0	$0	$0	$0	$0	$0
1707020404	$0	$0	$0	$0	$0	$0
1707020405	$0	$0	$0	$0	$0	$0
1707020406	$0	$0	$0	$0	$0	$0
1707020407	$0	$0	$0	$0	$0	$0
1707020408	$0	$0	$0	$0	$0	$0
1707020409	$0	$0	$0	$0	$0	$0
1707020410	$0	$0	$0	$0	$0	$0
1707020411	$0	$0	$0	$0	$0	$0
1707020412	$0	$0	$0	$0	$0	$0
1707020413	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412
1707020414	$0	$0	$0	$0	$0	$0
1707030603	$0	$0	$0	$0	$0	$0
1707030604	$0	$0	$0	$0	$0	$0
1707030605	$0	$0	$0	$0	$0	$0
1707030606	$0	$0	$0	$0	$0	$0
1707030607	$0	$0	$0	$0	$0	$0
1707030608	$0	$0	$0	$0	$0	$0
1707030610	$0	$0	$0	$0	$0	$0
1707030611	$0	$0	$0	$0	$0	$0
1707030612	$0	$0	$0	$0	$0	$0
1707030701	$0	$0	$0	$0	$0	$0
1707030702	$0	$0	$0	$0	$0	$0
1707030704	$0	$0	$0	$0	$0	$0
1707030705	$0	$0	$0	$0	$0	$0
1708000107	$1,353	$1,353	$1,382	$1,382	$1,412	$1,412

Appendix G
Energy Effects of Critical Habitat Designation

In this appendix, we consider the impacts of critical habitat designation for the 13 Pacific salmon and O. mykiss ESUs on the supply, distribution, or use of energy. On May 18, 2001, Executive Order No. 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," was issued. This order directs federal agencies to "weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy." It also directs those agencies to prepare and submit to OMB's Office of Information and Regulatory Affairs (OIRA) a "Statement of Energy Effects" for their "significant energy actions."

According to the order, a "significant energy action" is one that "is a significant regulatory action under Executive Order 12866 or any successor order, and is likely to have a significant adverse effect on the supply, distribution, or use of energy ..." OMB guidance suggests the following thresholds for determining whether an action has a "significant adverse effect" (OMB 2001):

1. Reductions in crude oil supply in excess of 10,000 barrels per day;
2. Reductions in fuel production in excess of 4,000 barrels per day;
3. Reductions in coal production in excess of 5 million tons per year;
4. Reductions in natural gas production in excess of 25 million mcf per year;
5. Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity;
6. Increases in energy use required by the regulatory action that exceed any of the thresholds above;
7. Increases in the cost of energy production in excess of one percent;
8. Increases in the cost of energy distribution in excess of one percent; or
9. Other similarly adverse outcomes.

For the purposes of critical habitat designation and its effects on energy, we will focus on the 5th and 7th thresholds.

In this appendix, we include an analysis of the co-extensive impacts of section 7 implementation even though this Executive Order falls outside the scope of the New Mexico Cattle Growers' Association v. U.S. Fish and Wildlife Service decision. This provides a consistent context throughout the report in which to gauge the relative impacts of section 7 on the different types of activities, including energy (hydropower). The determination called for under E.O. 13211, however, involves a comparison of the energy effects of critical habitat designation to the relevant thresholds cited above. This comparison necessarily uses *incremental* impacts, not co-extensive impacts.

Available data do not allow us to make a precise separation of these two types of impacts for hydropower projects. We present evidence, however, that supports a conclusion that the incremental energy effects of critical habitat designation are unlikely to exceed the thresholds defined above.

G 1. Hydropower Projects in the Pacific Northwest

Within the area covered by the potential critical habitat designations, there are over 300 hydropower projects, including the Federal Columbia River Power System (FCRPS). The projects range from very small projects with installed capacities considerably less than 5MW, to large projects such as Grand Coulee (6.8 GW installed capacity), Chief Joseph (2.6 GW), and John Day (2.5 GW). Within the Columbia River basin, the majority of major dams[1] are owned and operated by the federal government as part of the FCRPS. The FCRPS consists of 31 dams operated by the Army Corps of Engineers (21 dams, 14.5 GW) and the Bureau of Reclamation (10 dams, 7.5 GW). Non-federal major dams on the Columbia River include Wells (Douglas County Public Utility District No. 1, 774 MW), Rocky Reach and Rock Island (Chelan County Public Utility District No. 1, 1.9 GW) and Wanapum and Priest Rapids (Grant County Public Utility District No. 2, 2.0 GW). Other major hydropower dams are located on the Lewis River (PacifiCorp, 510 MW), the Cowlitz River (Tacoma Power, 462 MW), the Skokomish River (Tacoma Power, 124 MW), and the Skagit River (Seattle City Light, 689 MW)

G 2. Hydropower dams and Section 7 Implementation

As noted in Appendix D, hydropower projects account for about five percent of recent consultations under the ESA for Pacific salmon and O. mykiss, but a much larger proportion of the total annual impacts of section 7 implementation. Recent consultations are listed in Table G-1.

The primary modifications resulting from section 7 implementation include construction or improvements to fish passage facilities and programs, research and monitoring of water quality and fish passage efficiency, and offsite mitigation, such as land purchases for the purpose of conservation, and changes to the flow regime (either level or timing of flow). Data are not available to account for every modification to every one of the hydropower projects located in the area being considered for the critical habitat designations, particularly on modifications that may be required at some point in the future. An idea of the magnitude of the potential impacts, however, can be gathered from the record of the Bonneville Power Administration's fish and wildlife expenditures for the FCRPS, shown below in Table G-2 (repeating the information in Table D-1).

1. A major dam is one with an installed capacity greater than 5 MW.

Table G-1 NOAA Fisheries Hydropower Consultations, 2001-2004	
Date	**Consultation**
May 3, 2004	Consultation on License Amendment, Priest Rapids (FERC No. 2114)
March 23, 2004	Consultation on License Amendment, Cowlitz (FERC No. 2016)
March 3, 2004	Consultation on License Amendment, Wells (FERC No. 2149)
March 3, 2004	Consultation on License Amendment,. Rocky Reach (FERC No. 2145)
March 3, 2004	Consultation on License Amendment,. Rock Island (FERC No. 943)
February 27, 2004	Biological Opinion: Issuance of a License to operate, Cushman Hydroelectric Project (FERC No. 460).
October 21, 2003	Biological Opinion on the Bull Run Hydroelectric Project (No. 477-024) application to amend current license to extend the term of license and subsequently surrender the project.
August 12, 2003	Consultation on Habitat Conservation Plan, Columbia River, WA, Wells (FERC No. 2149)
August 12, 2003	Consultation on Habitat Conservation Plan, Columbia River, WA, Rocky Reach (FERC No. 2145)
August 12, 2003	Consultation on Habitat Conservation Plan, Columbia River, WA, Rock Island (FERC No. 943)
July 21, 2003	Biological Opinion on the effects of EWEB's Carmen-Smith Part 12 Submittal to FERC for Trail Bridge Dam Emergency Spillway Expansion, and Continued Operation of the Carmen-Smith Hydroelectric Project in the McKenzie Subbasin, Oregon on: Upper Willamette River chinook salmon
June 24, 2003	Biological Opinion on the Effects of Construction of Leaburg Tailrace Barrier and Modification of Leaburg Fish Screens, in the McKenzie River Subbasin, on Upper Willamette River Chinook Salmon
March 4, 2003	Biological Opinion for the Interim Operation of the North Fork (FERC No. 2195) and Oak Grove (FERC No. 135) Hydroelectric Projects through 2006
December 13, 2002	Biological Opinion on the North Umpqua Hydroelectric (Project No. 1927-008) relicensing and interim conservation measures
June 27, 2002	Biological Opinion for the Interim Operation of the Lewis River Hydroelectric Projects: Merwin FERC No. 935, Yale FERC No. 2071, Swift 1 FERC No. 2111, and Swift 2 FERC No. 2213
June 21, 2002	Biological Opinion on the Effects of issuing USACE Clean Water Act Section 404 permit #2002-00155 for construction activities at the Walterville Project, McKenzie River, Oregon.

Table G-1 NOAA Fisheries Hydropower Consultations, 2001-2004	
Date	**Consultation**
May 10, 2002	Biological Opinion on the effects of issuing USACE Clean Water Act Section 404 permit #2002-00109 for construction activities at the Leaburg Dam Fish Ladders, McKenzie River, Oregon.
March 11, 2002	Biological Opinion on Operation of the Rocky Reach Hydroelectric Project (FERC Project No. 2145) Including the Construction and Operation of a Juvenile Fish Bypass System.
January 24, 2002	Supplemental Biological Opinion on the operation and maintenance of the U.S. Bureau of Reclamation's (USBR) upper Snake River basin projects beyond March 31, 2002.
September 6, 2001	Biological Opinion on the Effects of the Relicensing of EWEB's Leaburg-Walterville Hydroelectric Project in the McKenzie Subbasin, Oregon.
May 2, 2001	Biological Opinion on U.S. Bureau of Reclamation Operations and Maintenance of its Projects in the Snake River Basin above Brownlee Dam through March 2002.

Table G-2 Impacts of Section 7 Implementation on the FCRPS		
BPA Program Element	**Annual Cost (millions)**	**Annual Cost attributable to 13 ESUs (millions)**
Fish & Wildlife Direct Program	$139.0	$111.2
Treasury Repayment for Past Capital Investments[2]	$56.7	$56.7
Operations and Maintenance (for fish)	$33.4	$33.4
Lower Snake River Compensation Plan Hatcheries	$15.1	$7.6
Power Planning Council	$4.0	$4.0
Transmission (attributable to fish and wildlife)	$34.7	$27.8
Lost/replacement power generation	$250.0	$250.0
Total Annual Costs	**$532.9**	**$503.6**

Source: NMFS (2004g)

2. This amount represents depreciation, amortization and interest on fish and wildlife capital investment, both for past Congressional appropriations of approximately $85 million annually for Corps of Engineers capital improvement at dams, and for the capital portion of BPA Fish and Wildlife program (for example, to construct hatcheries), funded by Treasury bonds.

Section 7 implementation also has significant impacts on energy production and costs of non-federal hydropower projects. The Grant County Public Utility District, for example, estimated its 2003 expenditures on salmon conservation programs, including lost power generation, at $65.1 million (Grant County P.U.D. 2004).

Not all of these expenditures have a direct link to energy production. For example, BPA's expenses include land acquisition and supplementation (hatchery) programs, as well as research and evaluation efforts. Similarly, the Grant PUD expenses include operation and maintenance of the Priest Rapids hatchery and several fish research programs. Nevertheless, these and other expense not directly related to hydropower energy production facilities are still viewed as "costs of energy production," as they are a component of the "license" to generate energy.

G 3. Energy Effects and Critical Habitat Designation

As noted above, while the impacts of section 7 implementation and other conservation measures on energy production may be significant, co-extensive impacts are not a proper component of the threshold tests required under E.O.13211. Incremental impacts – that is, the impacts of critical habitat designation on energy production and costs that are attributable *solely* to that regulation – are the impacts to be considered.

The available data do not allow us at this time to separate incremental impacts from co-extensive impacts precisely. Instead, we consider historical evidence of the energy effects of the jeopardy standard alone on hydropower activities. Because the enforcement of the jeopardy standard is a proper component of the baseline for the analysis of energy effects, the magnitude of these effects is relevant to assessing the likely magnitude of the incremental energy effects of critical habitat designation.

Below, we first give some context to the magnitude of the total impacts relative to the relevant thresholds under E.O. 13211. We then present evidence on the magnitude of the effects of the jeopardy standard alone on hydropower activities. Finally, we discuss our reasons for concluding that the incremental impacts of critical habitat designation are unlikely to exceed the thresholds.

We consider two threshold tests for the determination of whether critical habitat designation will have a "significant adverse effect on the supply, distribution, or use of energy":

5. Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity; and
7. Increases in the cost of energy production in excess of one percent.

Regarding the 5th threshold, there have been few instances in which section 7 implementation has resulted in a reduction in installed capacity.[3] The more relevant part of this threshold is the

3. An important exception is the case of the White River hydropower project discussed later in this appendix. The White River project had an installed capacity of 70 MW.

reduction in electricity production. Changes in the flow regime do affect the production of energy, and so we consider those impacts in this appendix.

For the FCRPS, the magnitude of the impacts on energy production itself can be gleaned from two studies conducted by the Northwest Power and Conservation Council (formerly, the Northwest Power Planning Council (NPPC)). The first study (NPPC 1997) examined the impacts on FCRPS energy production of various strategies for conserving Snake River chinook salmon and sockeye salmon. These strategies were compared to a baseline of a power-only strategy, or one in which the operation of the FCRPS was optimized for power generation without regard to fish and wildlife conservation.[4] The study included the impacts of the NOAA Fisheries biological opinion on the FCRPS issued in 1995 covering the Snake River ESUs (NMFS 1995).

The second study (NPPC 2000) also considered several conservation strategies and used the NOAA Fisheries 1998 biological opinion on the FCRPS (NMFS 1998) as its baseline. This study included a preliminary version of the NOAA Fisheries FCRPS biological opinion issued in 2000 (NMFS 2000). Although the implementation of that opinion varied from the assumptions made in NPPC (2000), the differences were minor (John Fazio, Northwest Power and Conservation Council, personal communication).

Table G-3
Impacts of Section 7 and Other Conservation Programs on FCRPS Energy Production

Event	Reduction in Energy Production (MWh)[1]
1995 biological opinion	7,446,000
1998 biological opinion	10,003,920
2000 biological opinion (preliminary)[2]	10,669,680

[1]Adapted from NPPC (1997) and NPPC (2000). Reductions are from a "power-only" baseline.
[2]This is a preliminary version of the FCRPS biological opinion that was issued in December 2000.

Based on these studies, Table G-3 shows changes in the energy production for the FCRPS through major milestones in the implementation of section 7. Because the baseline for these reductions is a power-only mode of operation and does not incorporate any impacts of the Northwest Power Act, it is inaccurate to characterize these figures as impacts of section 7 implementation. For that reason, they overstate those impacts.

4. This baseline is problematic for the purposes of gauging the impacts of section 7 implementation for the FCRPS because it does not include the impacts of the Northwest Power Act.

For the 7th threshold, a similar context can be given for BPA's fish and wildlife expenditures, including the monetary value of lost/replacement energy production. The BPA's Fish and Wildlife Program expenses can be divided into capital and operating expenses, and can be compared to the BPA's total capital and operating expenses (BPA 2004). Table G-4 gives these figures.

The Fish and Wildlife Program expenses do not include expenditures outside the program that may be attributable to conservation, such as also those listed in Table G-2. Nor do they include the cost of lost/replacement power, which is estimated to be about $250 million annually. Taking these omissions into account puts the BPA's conservation expenses in the range of 10-15% of total expenses.

For both thresholds, the total impacts of the conservation measures undertaken by the BPA alone for the FCRPS exceed the thresholds for determining that an adverse energy effect is significant. This does not mean, however, that the incremental impacts of critical habitat designation on energy production and use also exceed the thresholds. The total impacts described above are a combination of incremental and coextensive impacts. Currently, there is no direct evidence that allows us to separate these two types of impacts for the FCRPS. In other cases, however, hydropower activities have been modified by the application of the jeopardy standard alone.

Table G-4
FCRPS Fish and Wildlife Program Expenses relative to All FCRPS Expenses[1]

Type of Expense	FY2003	FY2004	FY2005
Fish and Wildlife Program Expenses			
Capital Investment Obligations	11,633	36,000	36,000
Operating Expenses	147,798	138,834	138,834
Total	159,431	174,834	174,834
Total Expenses and other Obligations			
Capital Investment Obligations	473,366	597,600	486,900
Operating Expenses	2,870,780	3,108,600	3,239,800
Other	543,687	246,508	303,098
Total	3,887,833	3,952,708	4,029,798
F&W % of Total	4.10%	4.42%	4.34%

[1]FY2003 figures are audited actual expenses; FY2004 are revised budget expenses; and FY2005 are proposed budget expenses.

In a draft opinion for the Baker River hydroelectric project (operated by Puget Sound Energy and licensed by FERC), the measures adopted to satisfy section 7 included the development of a new turbine generator to replace power lost through operational changes (NMFS 2004f). Although no

generating capacity was lost, annual energy production costs increased by more than $10 million (Puget Sound Energy 2004, Exhibit D). A second example is a draft opinion for the White River hydropower project (also operated by Puget Sound Energy and licensed by FERC), which recommended changes to the project's flow regime and other measures to improve fish passage and water quality (NMFS 2003h). These proposed changes were expensive enough to foreclose the possibility of operating economically and the hydropower project was shut down. In these two cases, the biological opinions did not include an analysis of the effects on critical habitat because the designation (for Puget Sound chinook salmon) had been vacated in 2003.

Because critical habitat was not designated (in these cases), the impacts of section 7 implementation on the hydropower projects covered in the consultations are attributable to the enforcement of the jeopardy standard alone. This does not mean that critical habitat designation will have no incremental impact, but it suggests that any additional modifications to these projects attributable to critical habitat designation would be in addition to what is already a "strong" set of restrictions. For this reason, while the total impacts of section 7 implementation on energy production may be significant, the likelihood that the incremental impacts of critical habitat designation on hydropower projects will also be significant is very low, assuming that future enforcement of the jeopardy standard is similar to its past enforcement. For that reason, NOAA Fisheries believes that the energy effects of critical habitat designation are unlikely to exceed the thresholds identified above.

Appendix H
The Impacts of Section 7 Implementation on Pesticide Use

The Environmental Protection Agency (EPA) was recently enjoined from authorizing the application of a set of pesticides within a certain distance from "salmon supporting waters."[1] For aerial applications, the distance is 100 yards; for ground applications, the distance is 20 yards. The basis for this injunction was the EPA's failure to consult with NOAA Fisheries under section 7 of the ESA concerning possible adverse effects of pesticide application on ESA-protected salmon and O. mykiss. The injunction was allowed to remain in place by the Ninth Circuit Court of Appeals, and so as of the date of this report, the court-ordered restriction continues to apply pending appeal.[2] The effect of this injunction is to create an additional set of activities to be considered in the analysis, in that the restrictions on pesticide use can be viewed as a habitat-related, coextensive impact of section 7.

NOAA Fisheries does not yet have sufficient data to estimate these impacts at the watershed level. In this appendix, we present preliminary estimates of the impacts at the ESU level and for all ESUs as a whole. Our approach draws on a previous study by the Department of Agriculture of the impact of the restrictions on the gross revenues of agricultural production in Washington and Oregon. (USDA 2003).

H 1. Estimating the Impacts of Restrictions on Pesticide Use

Pesticides are one of many inputs into the agricultural production process. When land (owned or rented) is used for agriculture, the output is the result of a series of economic decisions. At the highest level is the decision to use the land for agriculture or for some alternate type of use. Beyond this there are myriad choices of which crops to grow; where, how, and when to grow them; how and how much to supply other inputs such as fertilizer and irrigation; how and when to harvest the production; how and how much to manage potential crop damage with pesticides and other pest or disease control methods; and so on.

In many cases, the chosen course of action is one among many possibilities, some of which may be close to the preferred one in terms of the economic value obtained; in other cases, circumstances or the nature of the possibilities make one choice significantly better than all others or even the only choice that produces a positive return. And in all instances, the choices may be constrained by law or regulation, effectively limiting the availability and value of the alternatives.

In this economic view of agricultural production, the court's injunction on the use of certain pesticides can be taken as an additional constraint on the agricultural production process. A static view of this constraint assumes that the agricultural production process does not adjust to mitigate the effects of the pesticide restrictions. Assuming that no crops could be grown or that no other use

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1. *Washington Toxics Coalition, et al., v. EPA*, C01-0132 (W.D. WA), January 22, 2004.
2. *Washington Toxics Coalition et. al v. EPA*, No. 04-35138, May 4 and June 22, 2004.

of the land is possible, the impact is the lost net value of the production from the lands covered by the court injunction.

This static view, however, will not produce an accurate estimate of the actual impact for two reasons, each of which introduces bias in a different direction. The static view overestimates the actual impact if there are alternatives that retain some positive value for the affected lands. These alternatives span the full set of choices, both short-term and long-term, that are not constrained by law or regulation. For example, there may be alternative pesticides that do not adversely affect salmon or O. mykiss, or even other pest-control methods, that have higher costs or lower effectiveness (or both) but still allow the producer to obtain a positive return from the land. Similarly, there may be other crops or even other uses of the land that obtain the same result. Within the court's injunction itself, it is possible to reduce the extent of the restriction by switching from aerial to ground pesticide applications. While this may entail higher costs, it may still provide a positive return and so be preferable to no production at all. For these examples, the static view will overestimate the impact of the restriction.

Working in the opposite direction is the possibility that pesticide use may be complementary to other inputs used on land outside the buffers. For example, pesticide application in border areas (such as the lands along streams in the buffers) may make it easier to manage interior lands. If this is the case, reducing or eliminating pesticide use in the buffers will lower the productivity of other inputs, raising the costs of production. This will in turn reduce net revenue by more than the amount lost from the lands within the buffers. In this case, the static view underestimates the impact of the restriction.

Accounting for the myriad possible responses to a restriction on pesticides entails gathering significantly detailed data as well as modeling the agricultural process in sophisticated ways. NOAA Fisheries has not yet developed the models nor gathered sufficient data to estimate the impacts in this way. We have begun the process of doing so and intend to produce impact estimates at the watershed level before the final rule is promulgated. Our efforts will focus on two major questions: 1) What types and how many acres of land are constrained by the pesticide restriction? and 2) For each type of land affected by the restriction, what is the impact of the restriction (measured on a per-acre basis)?

For the first question, we will focus on agricultural land uses but will also consider non-agricultural land uses that may be affected by the restriction. For the second question, we will investigate how the value of the impact is determined by various factors, including the following:

- Type of land use
- Geographic location (state, county)
- Opportunities for mitigating the impacts of the restriction, including
    - Substitute pesticides (that are not restricted by section 7 implementation)
    - Substitute land management practices
    - Substitute land uses
- Indirect impacts of pesticide restrictions

Information on these factors will enable us to estimate per-acre impacts more accurately, in that it may be possible to model the impacts as a function of land use, location, crop type, pesticide type, and so forth. By doing so, our estimate of the impact will vary with the set of factors characterizing a watershed.

H 2. Preliminary Estimated Impacts of Restrictions on Pesticide Use for the 13 ESUs

Below, we provide preliminary estimates of the impacts using the static view described above, focusing on two measures: gross agricultural revenue and net agricultural revenue. Our estimates are based on land use data for Washington and Oregon and incorporate some of the analysis in USDA (2003). To make these estimates, we took the following steps.

1) We used information gathered from federal and state agencies and Pacific Northwest Indian tribes to determine the geographic area occupied by the 13 Pacific salmon and O. mykiss ESUs at the time of their listing. The rivers and streams in this area correspond to the extent of the "salmon bearing waters," to use the court language, that we then considered in the analysis. We incorporated this information into a GIS database and created boundaries that corresponded to the court-ordered buffer widths of 100 and 20 yards on each side of the rivers and streams.

2) We then used National Land Cover spatial data (NLCD) to estimate the acreage within the 20 yard and 100 yard buffers of different land uses potentially affected by the pesticide restrictions imposed by the court injunction. Following USDA (2003), we included three land use categories: orchards/vineyards (NLCD class 61), row crops (NLCD class 82), and small grains (NLCD class 83).[3]

3) We next used per-acre gross revenue values from USDA (2003) to generate our first measure of the buffer impacts. For each ESU and buffer width, we multiplied the per-acre value by the estimated acreage in the corresponding land use category.

4) Finally, we obtained a second measure of the impacts by adjusting the per-acre values taken from USDA (2003) to get an estimate of the impacts on net revenue. We used data from Huppert et al. (2004) to make these adjustments. They investigated the impact of changes in the availability of water rights in the Columbia River basin and focused on changes in the value of irrigated agricultural production. They used enterprise budget studies and data on prices and acreage to estimate gross and net revenue for a variety of crops. These crops included orchards, vegetables, and potatoes. Their estimates for these crops produced a ratio of net to gross per-acre revenue that ranged between 5.7% and

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3. Unlike USDA (2003), we did not adjust the estimates to account for acreage changes since the NLCD was gathered in the early/mid-1990s. An adjustment method will be developed for the estimation of impacts at the watershed level.

19.7%.[4] To make our adjustments, we simplified this range to 5% to 20% to give a low and high estimate.

Tables H-1 to H-5 present the results of our preliminary analysis. Table H-1 lists the per-acre values of the gross revenue impacts for each land use category and state, while Table H-2 lists the estimated acreage for each of the three land use categories in each ESU and for the 13 ESUs combined,[5] for both buffer widths. The last three tables list the estimated impacts using the two measures: gross revenue impacts (Table H-3), net revenue impacts assuming a 5% margin (Table H-4), and net revenue impacts assuming a 20% margin (Table H-5).

Table H-1
Per-acre Values (Gross Revenue) of Agricultural Land

State	Per-acre value ($)		
	Orchards/ Vineyards	**Row Crops**	**Small Grains**
Washington	$4817	$1449	$173
Oregon	$2569	$1445	$158
Source: USDA (2003)			

4. Huppert et al. (2004), Tables 3.1 and 3.4.

5. The estimate of the aggregate impacts for all ESUs is not the sum of the estimates for the individual ESUs because some watersheds are contained within more than one ESU.

Table H-2 Acreage of Land in Buffers			
20 Yard Buffer			
ESU	**Orchards/ Vineyards**	**Row Crops**	**Small Grains**
Puget Sound chinook salmon	102.3	137.8	69.6
Lower Columbia R. chinook salmon	59.5	89.4	27.1
Upper Willamette R. chinook salmon	292.3	535.7	251.7
Upper Columbia R. chinook salmon	338.2	0.5	12.7
Oregon Coast coho salmon	4.4	45.0	60.5
Hood Canal summer-run chum salmon	0.0	0.0	0.5
Columbia R. chum salmon	7.7	56.6	18.5
Ozette Lake sockeye salmon	0.0	0.0	0.0
Upper Columbia R. O. mykiss	729.4	4.5	17.3
Snake R. Basin O. mykiss*	3.3	114.9	2,092.4
Lower Columbia R. O. mykiss	166.5	237.2	59.7
Upper Willamette R. O. mykiss	1,058.7	565.9	579.1
Middle Columbia R. O. mykiss	763.8	482.1	2,614.6
Aggregate Acreage, 13 ESUs	**2,905.9**	**1,721.7**	**5,536.0**
100 Yard Buffer			
Puget Sound chinook salmon	466.0	758.4	352.9
Lower Columbia R. chinook salmon	343.4	624.9	143.9
Upper Willamette R. chinook salmon	1,453.2	2,753.2	1,335.7
Upper Columbia R. chinook salmon	1,576.1	4.0	62.9
Oregon Coast coho salmon	23.5	240.6	276.8
Hood Canal summer-run chum salmon	11.9	0.1	3.1
Columbia R. chum salmon	46.7	273.2	86.2
Ozette Lake sockeye salmon	0.0	0.0	0.2
Upper Columbia R. O. mykiss	3,460.4	29.1	83.2
Snake R. Basin O. mykiss*	13.0	394.4	9,445.3
Lower Columbia R. O. mykiss	844.5	1,163.8	263.5
Upper Willamette R. O. mykiss	5,038.5	2,814.3	2,950.2
Middle Columbia R. O. mykiss	3,684.8	2,363.2	13,403.8
Aggregate Acreage, 13 ESUs	**13,945.9**	**8,476.3**	**27,014.7**
*Estimates for the Snake River Basin O. mykiss ESU are for the Washington and Oregon portions of the ESU only.			

Table H-3 Gross Revenue Impacts of Pesticide Restrictions				
20 Yard Buffer				
ESU	**Orchards/ Vineyards**	**Row Crops**	**Small Grains**	**Total**
Puget Sound chinook salmon	$492,861	$199,675	$12,036	$704,572
Lower Columbia R. chinook salmon	$173,122	$129,851	$4,568	$307,542
Upper Willamette R. chinook salmon	$750,890	$779,506	$39,763	$1,570,159
Upper Columbia R. chinook salmon	$1,629,003	$675	$2,196	$1,631,875
Oregon Coast coho salmon	$11,274	$65,483	$9,566	$86,323
Hood Canal summer-run chum salmon	$0	$0	$83	$83
Columbia R. chum salmon	$36,364	$82,058	$3,191	$121,613
Ozette Lake sockeye salmon	$0	$0	$0	$0
Upper Columbia R. O. mykiss	$3,513,698	$6,474	$3,000	$3,523,172
Snake R. Basin O. mykiss*	$3,165	$2,238	$251,613	$257,016
Lower Columbia R. O. mykiss	$468,415	$344,221	$10,129	$822,765
Upper Willamette R. O. mykiss	$2,719,718	$823,454	$91,494	$3,634,667
Middle Columbia R. O. mykiss	$3,524,510	$699,838	$436,358	$4,660,707
Aggregate Impact, 13 ESUs	**$10,937,411**	**$2,336,708**	**$820,950**	**$14,095,070**
100 Yard Buffer				
Puget Sound chinook salmon	$2,244,905	$1,098,859	$61,044	$3,404,808
Lower Columbia R. chinook salmon	$1,020,323	$907,170	$24,306	$1,951,799
Upper Willamette R. chinook salmon	$3,733,178	$4,005,861	$211,036	$7,950,075
Upper Columbia R. chinook salmon	$7,592,035	$5,845	$10,885	$7,608,766
Oregon Coast coho salmon	$60,492	$350,126	$43,734	$454,351
Hood Canal summer-run chum salmon	$57,216	$155	$536	$57,908
Columbia R. chum salmon	$220,275	$395,858	$14,908	$631,041
Ozette Lake sockeye salmon	$0	$0	$38	$38
Upper Columbia R. O. mykiss	$16,668,790	$42,191	$14,392	$16,725,373
Snake R. Basin O. mykiss*	$14,800	$10,909	$1,083,314	$1,109,023
Lower Columbia R. O. mykiss	$2,364,929	$1,688,963	$44,659	$4,098,551
Upper Willamette R. O. mykiss	$12,943,814	$4,094,820	$466,127	$17,504,761
Middle Columbia R. O. mykiss	$16,998,100	$3,430,635	$2,234,339	$22,663,073
Aggregate Impact, 13 ESUs	**$52,402,358**	**$11,753,142**	**$3,985,425**	**$68,140,925**
*Estimates for the Snake River Basin O. mykiss ESU are for the Washington and Oregon portions of the ESU only.				

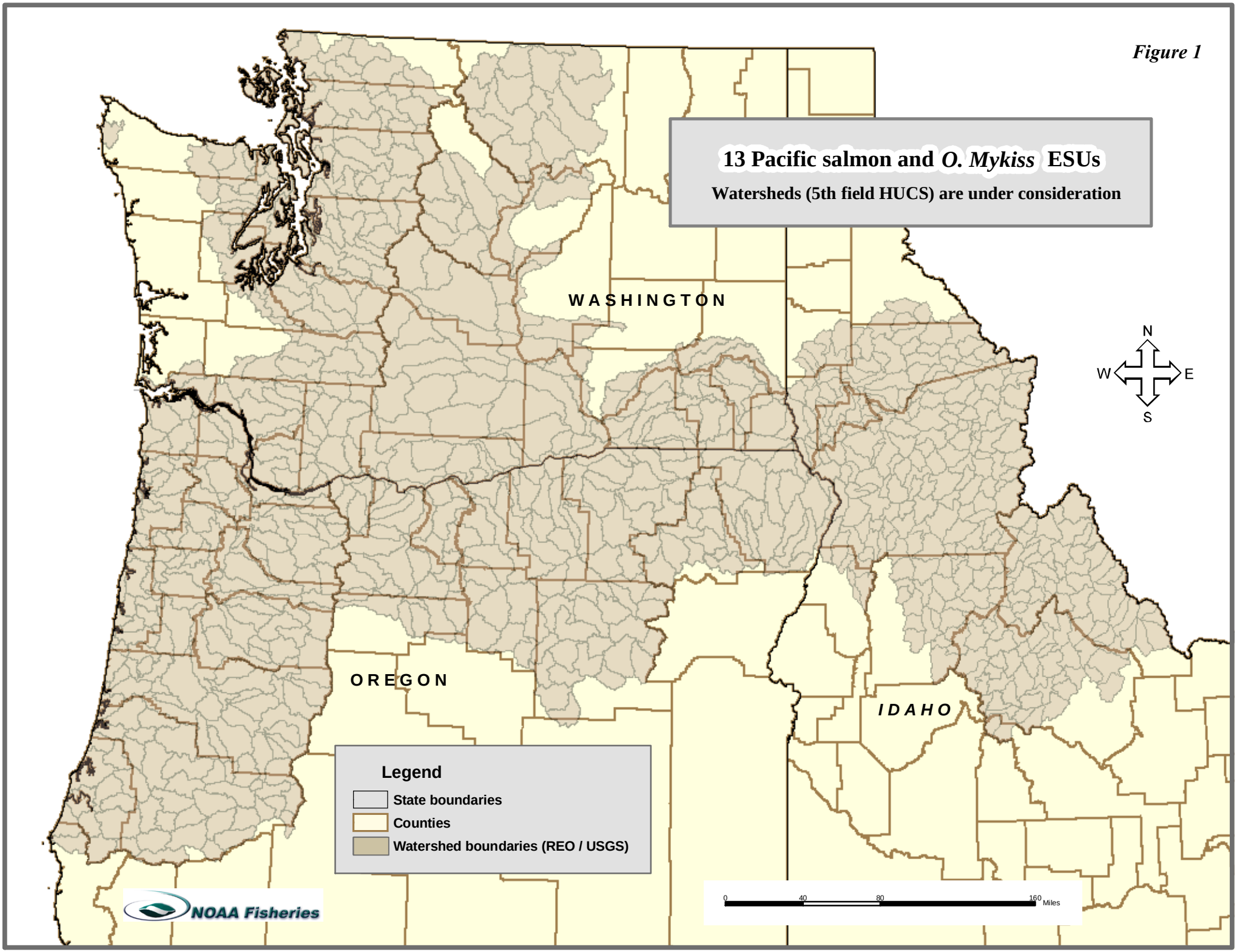
Table H-4 Net Revenue (5% margin) Impacts of Pesticide Restrictions				
20 Yard Buffer				
ESU	**Orchards/ Vineyards**	**Row Crops**	**Small Grains**	**Total**
Puget Sound chinook salmon	$24,643	$9,984	$602	$35,229
Lower Columbia R. chinook salmon	$8,656	$6,493	$228	$15,377
Upper Willamette R. chinook salmon	$37,545	$38,975	$1,988	$78,508
Upper Columbia R. chinook salmon	$81,450	$34	$110	$81,594
Oregon Coast coho salmon	$564	$3,274	$478	$4,316
Hood Canal summer-run chum salmon	$0	$0	$4	$4
Columbia R. chum salmon	$1,818	$4,103	$160	$6,081
Ozette Lake sockeye salmon	$0	$0	$0	$0
Upper Columbia R. O. mykiss	$175,685	$324	$150	$176,159
Snake R. Basin O. mykiss*	$158	$112	$12,581	$12,851
Lower Columbia R. O. mykiss	$23,421	$17,211	$506	$41,138
Upper Willamette R. O. mykiss	$135,986	$41,173	$4,575	$181,733
Middle Columbia R. O. mykiss	$176,226	$34,992	$21,818	$233,035
Aggregate Impact, 13 ESUs	**$546,871**	**$116,835**	**$41,047**	**$704,753**
100 Yard Buffer				
Puget Sound chinook salmon	$112,245	$54,943	$3,052	$170,240
Lower Columbia R. chinook salmon	$51,016	$45,359	$1,215	$97,590
Upper Willamette R. chinook salmon	$186,659	$200,293	$10,552	$397,504
Upper Columbia R. chinook salmon	$379,602	$292	$544	$380,438
Oregon Coast coho salmon	$3,025	$17,506	$2,187	$22,718
Hood Canal summer-run chum salmon	$2,861	$8	$27	$2,895
Columbia R. chum salmon	$11,014	$19,793	$745	$31,552
Ozette Lake sockeye salmon	$0	$0	$2	$2
Upper Columbia R. O. mykiss	$833,440	$2,110	$720	$836,269
Snake R. Basin O. mykiss*	$740	$545	$54,166	$55,451
Lower Columbia R. O. mykiss	$118,246	$84,448	$2,233	$204,928
Upper Willamette R. O. mykiss	$647,191	$204,741	$23,306	$875,238
Middle Columbia R. O. mykiss	$849,905	$171,532	$111,717	$1,133,154
Aggregate Impact, 13 ESUs	**$2,620,118**	**$587,657**	**$199,271**	**$3,407,046**
*Estimates for the Snake River Basin O. mykiss ESU are for the Washington and Oregon portions of the ESU only.				

Table H-5 Net Revenue (20% margin) Impacts of Pesticide Restrictions				
20 Yard Buffer				
ESU	**Orchards/ Vineyards**	**Row Crops**	**Small Grains**	**Total**
Puget Sound chinook salmon	$98,572	$39,935	$2,407	$140,914
Lower Columbia R. chinook salmon	$34,624	$25,970	$914	$61,508
Upper Willamette R. chinook salmon	$150,178	$155,901	$7,953	$314,032
Upper Columbia R. chinook salmon	$325,801	$135	$439	$326,375
Oregon Coast coho salmon	$2,255	$13,097	$1,913	$17,265
Hood Canal summer-run chum salmon	$0	$0	$17	$17
Columbia R. chum salmon	$7,273	$16,412	$638	$24,323
Ozette Lake sockeye salmon	$0	$0	$0	$0
Upper Columbia R. O. mykiss	$702,740	$1,295	$600	$704,634
Snake R. Basin O. mykiss*	$633	$448	$50,323	$51,403
Lower Columbia R. O. mykiss	$93,683	$68,844	$2,026	$164,553
Upper Willamette R. O. mykiss	$543,944	$164,691	$18,299	$726,933
Middle Columbia R. O. mykiss	$704,902	$139,968	$87,272	$932,141
Aggregate Impact, 13 ESUs	**$2,187,482**	**$467,342**	**$164,190**	**$2,819,014**
100 Yard Buffer				
Puget Sound chinook salmon	$448,981	$219,772	$12,209	$680,962
Lower Columbia R. chinook salmon	$204,065	$181,434	$4,861	$390,360
Upper Willamette R. chinook salmon	$746,636	$801,172	$42,207	$1,590,015
Upper Columbia R. chinook salmon	$1,518,407	$1,169	$2,177	$1,521,753
Oregon Coast coho salmon	$12,098	$70,025	$8,747	$90,870
Hood Canal summer-run chum salmon	$11,443	$31	$107	$11,582
Columbia R. chum salmon	$44,055	$79,172	$2,982	$126,208
Ozette Lake sockeye salmon	$0	$0	$8	$8
Upper Columbia R. O. mykiss	$3,333,758	$8,438	$2,878	$3,345,075
Snake R. Basin O. mykiss*	$2,960	$2,182	$216,663	$221,805
Lower Columbia R. O. mykiss	$472,986	$337,793	$8,932	$819,710
Upper Willamette R. O. mykiss	$2,588,763	$818,964	$93,225	$3,500,952
Middle Columbia R. O. mykiss	$3,399,620	$686,127	$446,868	$4,532,615
Aggregate Impact, 13 ESUs	**$10,480,472**	**$2,350,628**	**$797,085**	**$13,628,185**
*Estimates for the Snake River Basin O. mykiss ESU are for the Washington and Oregon portions of the ESU only.				

Map Appendix

Figures 1-14: ESU Watersheds and Counties

Figures 15-28: Economic Impacts of Critical Habitat Designation and Section 7 Implementation



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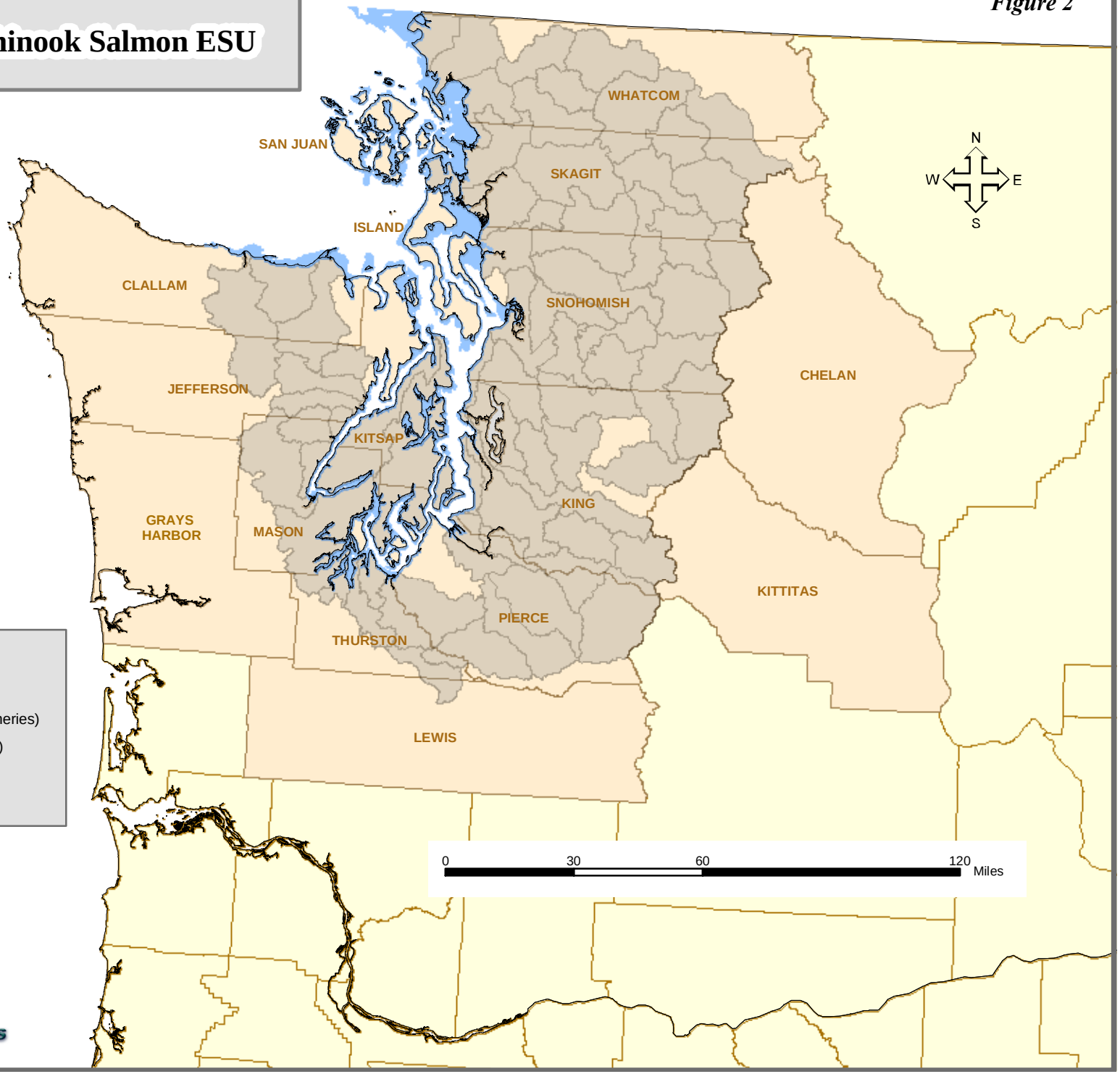
Puget Sound Chinook Salmon ESU

Figure 2



Legend

- State boundaries
- Nearshore marine areas (NOAA Fisheries)
- Watershed boundaries (REO/ USGS)
- Other counties
- Counties with land inside the ESU

NOAA Fisheries

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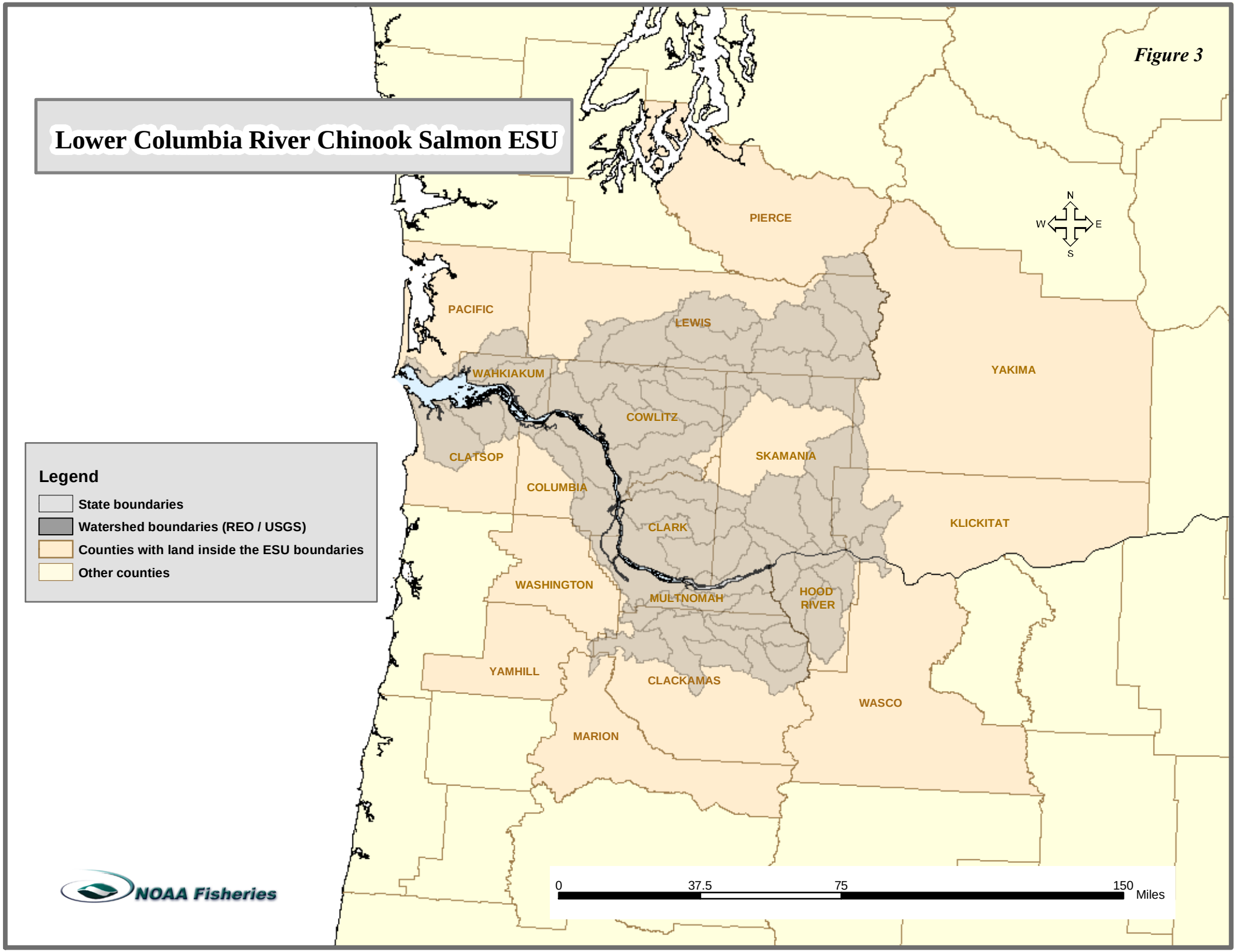

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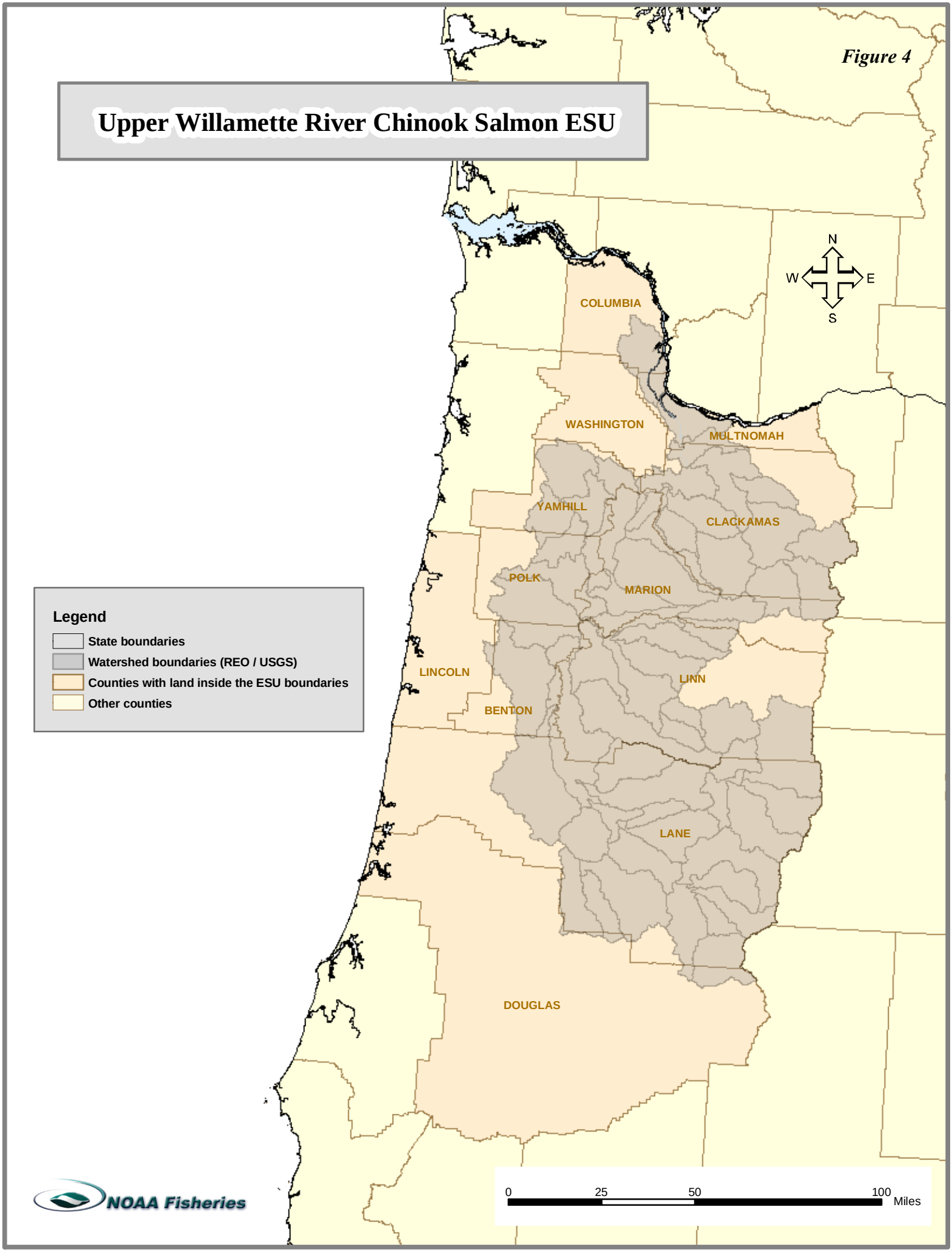

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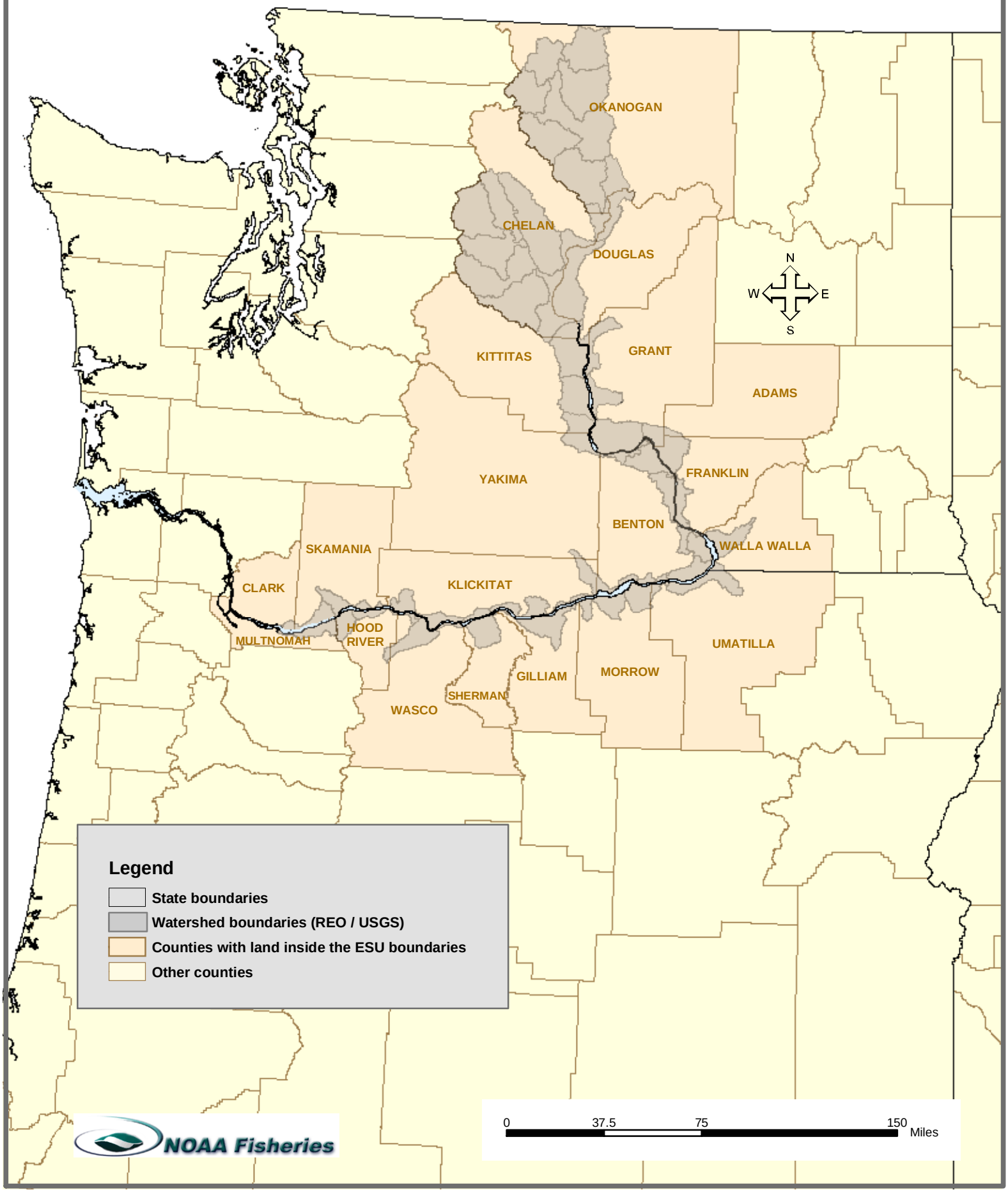
Upper Columbia River Chinook Spring-Run Salmon ESU

Figure 5



Draft - November 15, 2004

Figure 6

Oregon Coast Coho Salmon ESU

Legend

- State boundaries
- Watershed boundaries (REO / USGS)
- Other counties
- Counties with land inside the ESU boundaries

NOAA Fisheries

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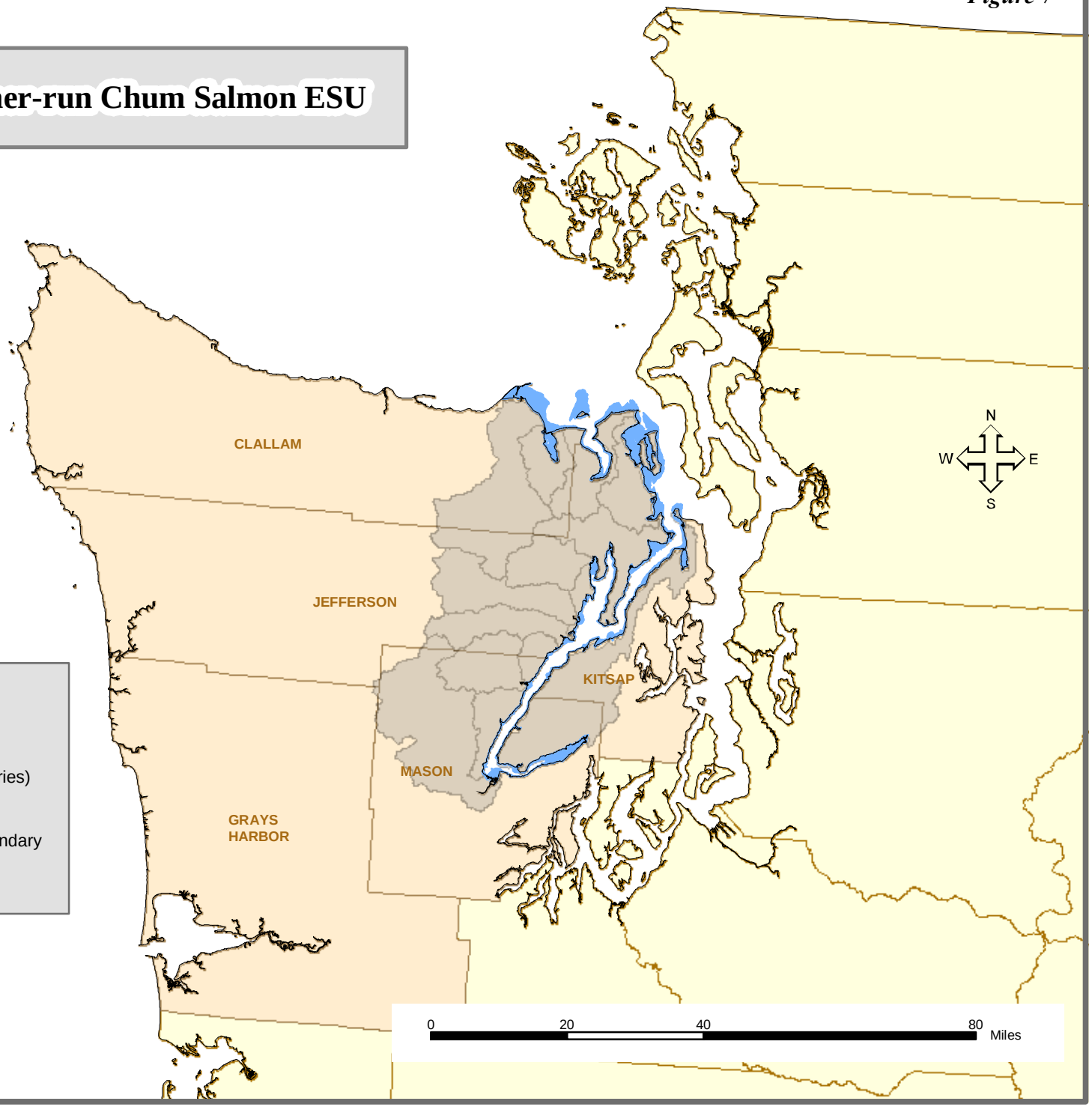
Figure 7

Hood Canal Summer-run Chum Salmon ESU



Legend

- State boundaries
- Nearshore marine areas (NOAA Fisheries)
- Watershed boundaries (REO / USGS)
- Counties with land inside the ESU boundary
- Other Counties

NOAA Fisheries

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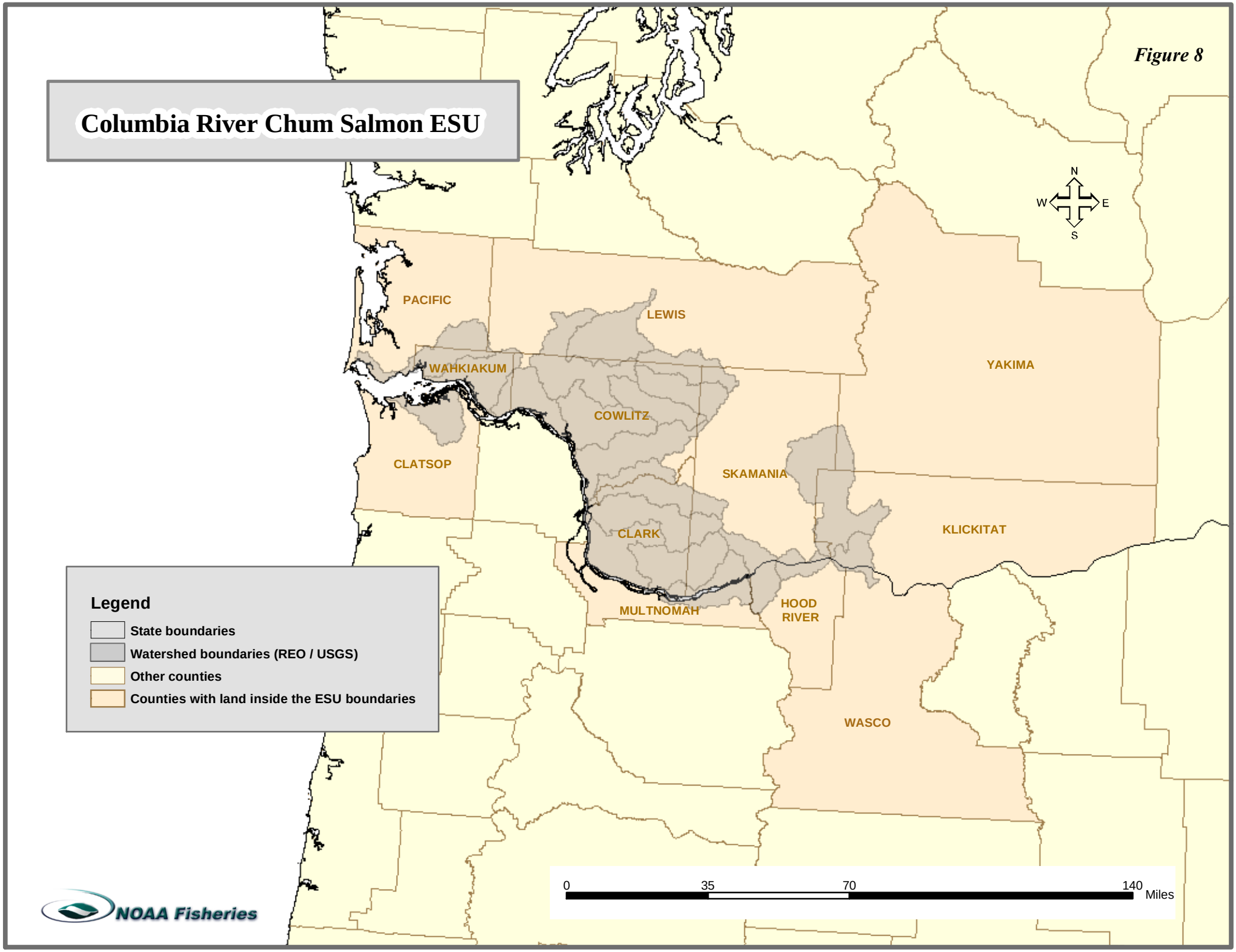

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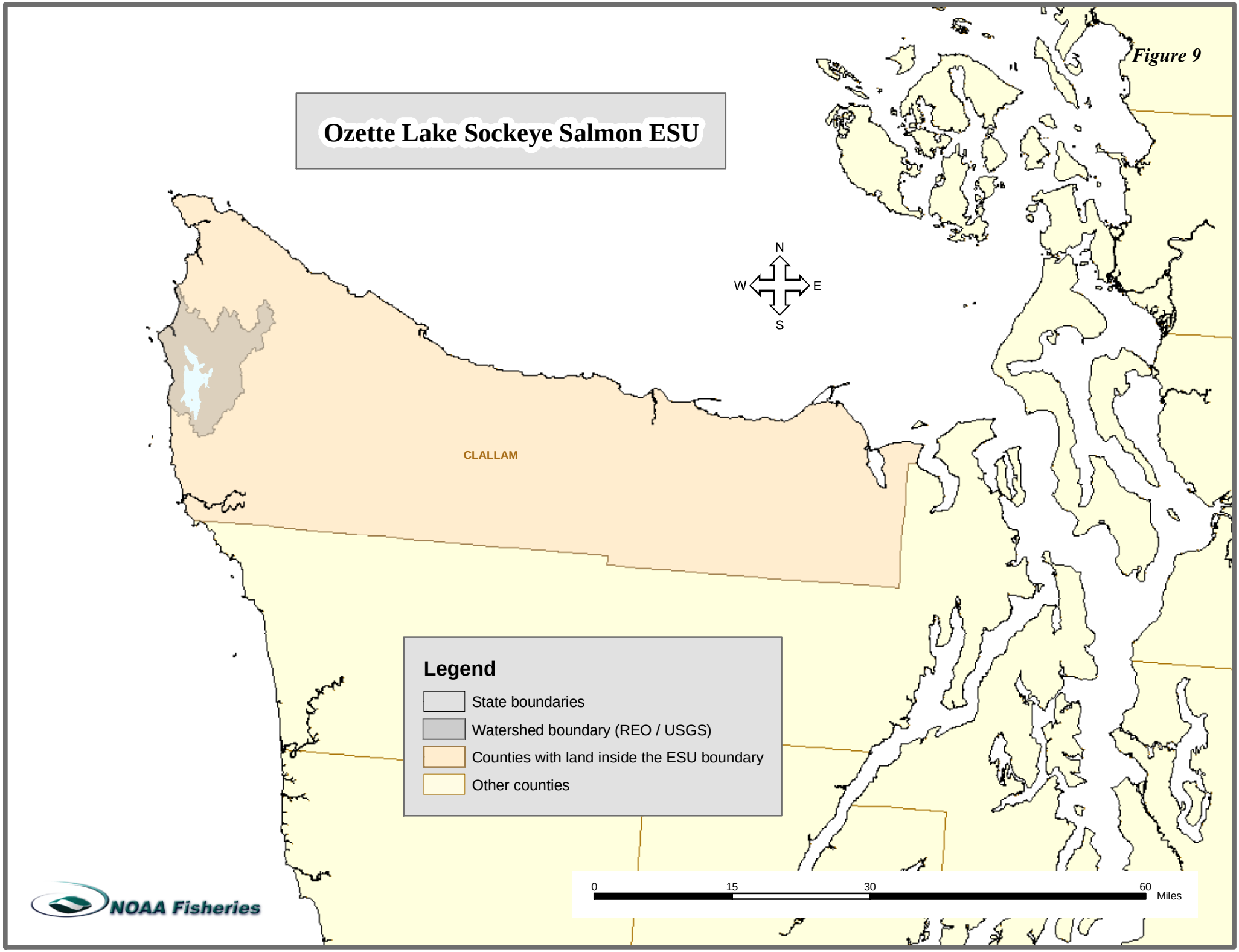
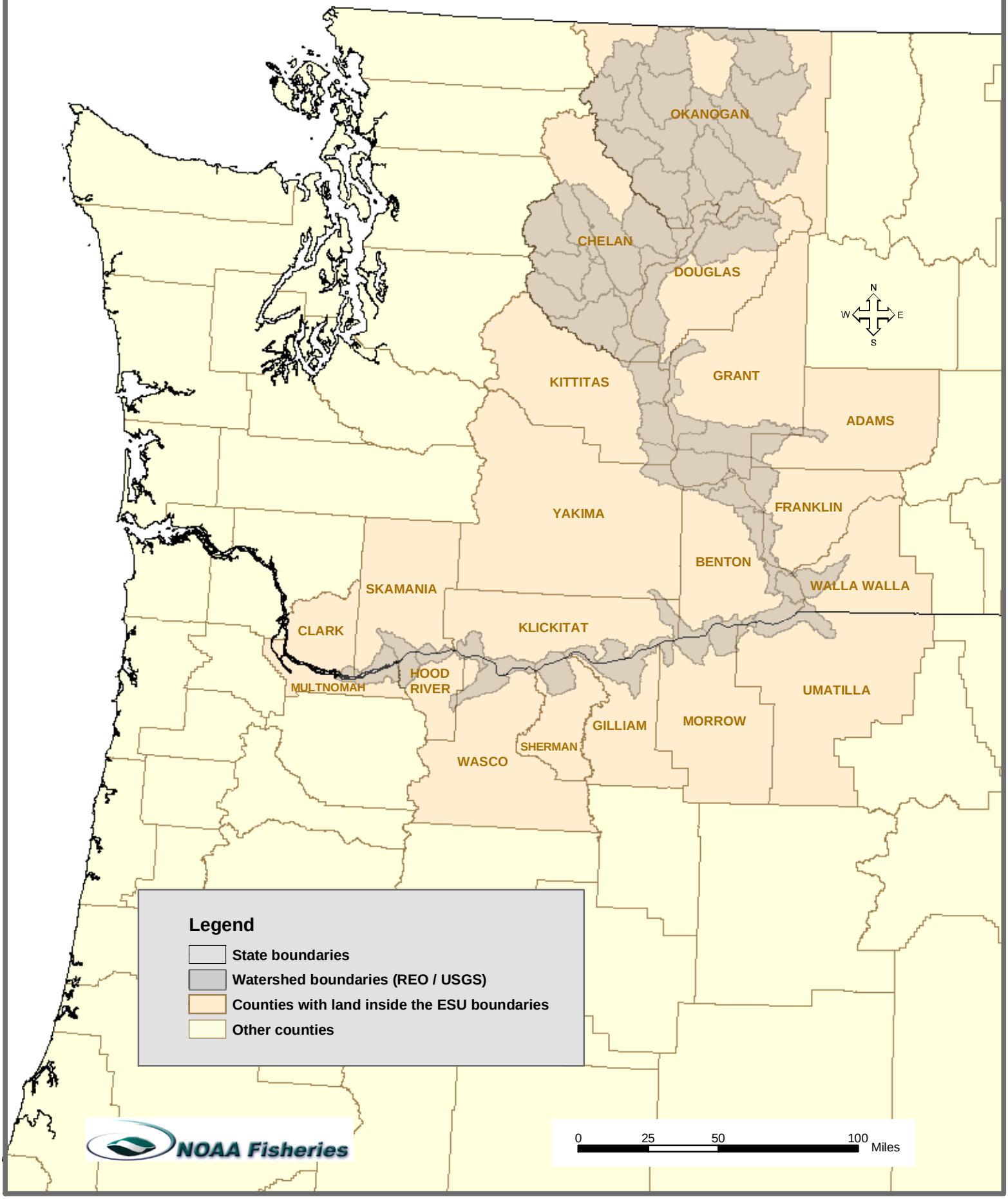


Figure 9
Ozette Lake Sockeye Salmon ESU
N
W
E
S
CLALLAM
Legend
State boundaries
Watershed boundary (REO / USGS)
Counties with land inside the ESU boundary
Other counties
0
15
30
60
Miles
NOAA Fisheries

Upper Columbia River *O. Mykiss* ESU

Figure 10



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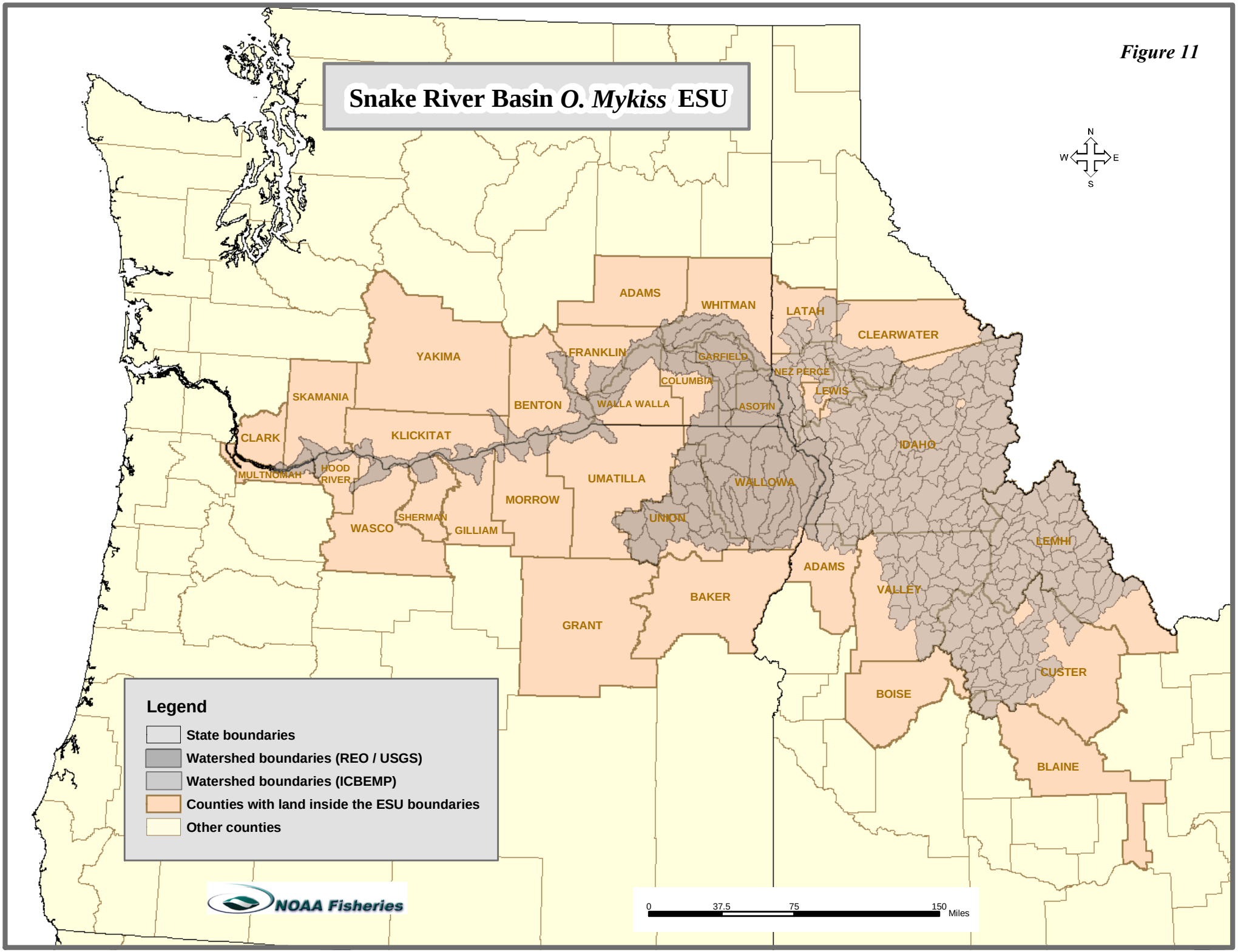

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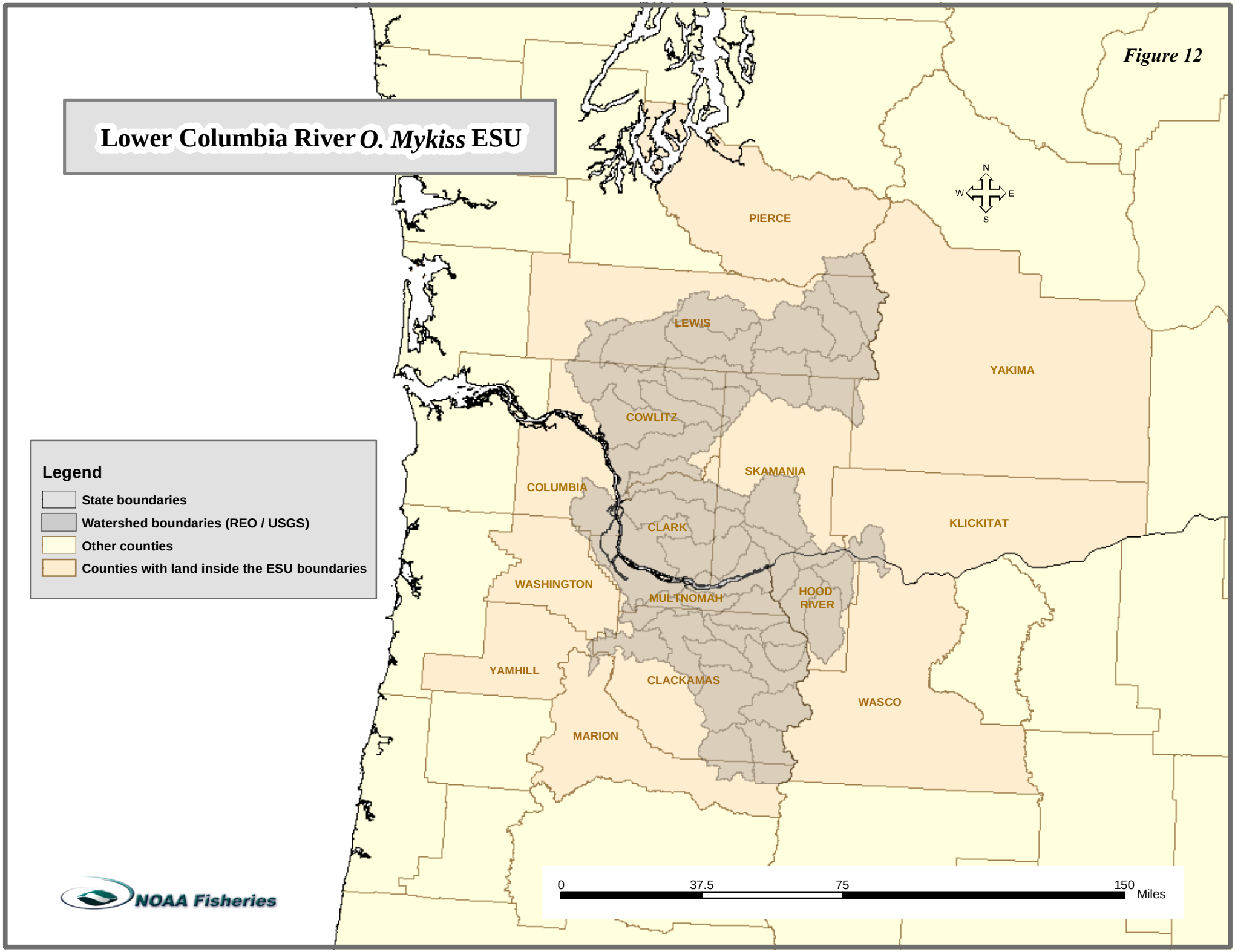

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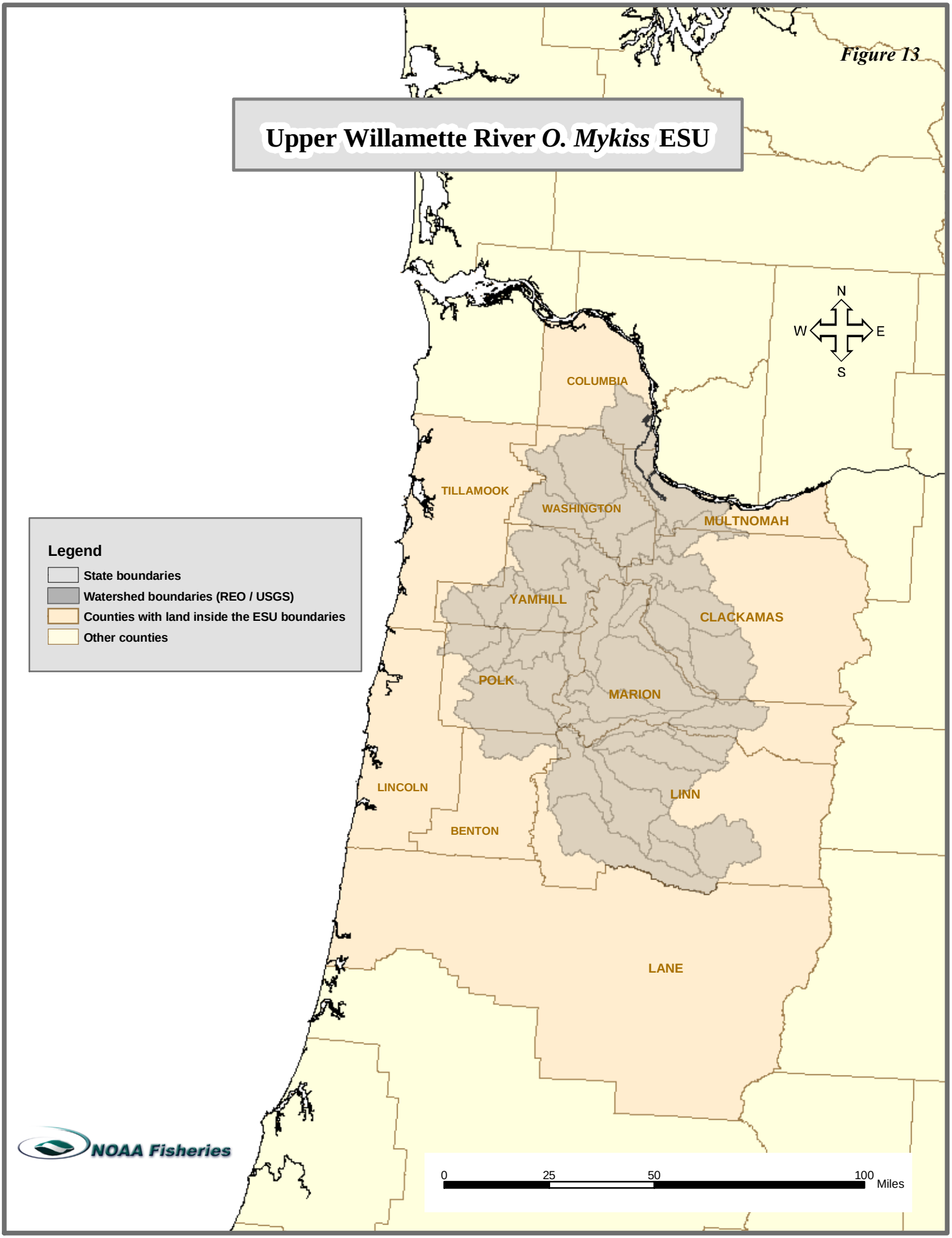
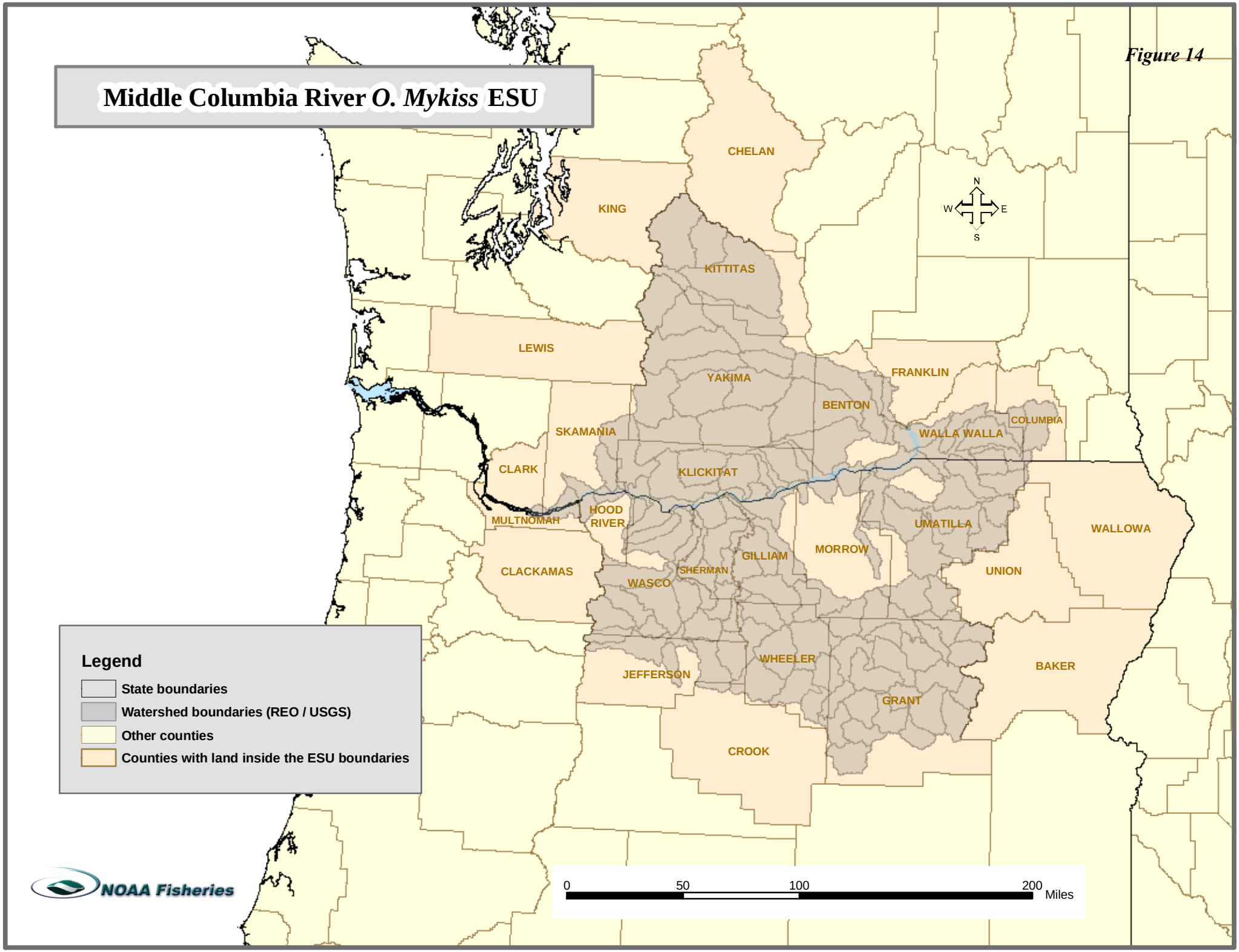


Figure 13
Upper Willamette River O. Mykiss ESU
N
W
E
S
COLUMBIA
TILLAMOOK
WASHINGTON
MULTNOMAH
YAMHILL
CLACKAMAS
POLK
MARION
LINCOLN
LINN
BENTON
LANE
Legend
State boundaries
Watershed boundaries (REO / USGS)
Counties with land inside the ESU boundaries
Other counties
NOAA Fisheries
0
25
50
100
Miles



Draft - November 15, 2004

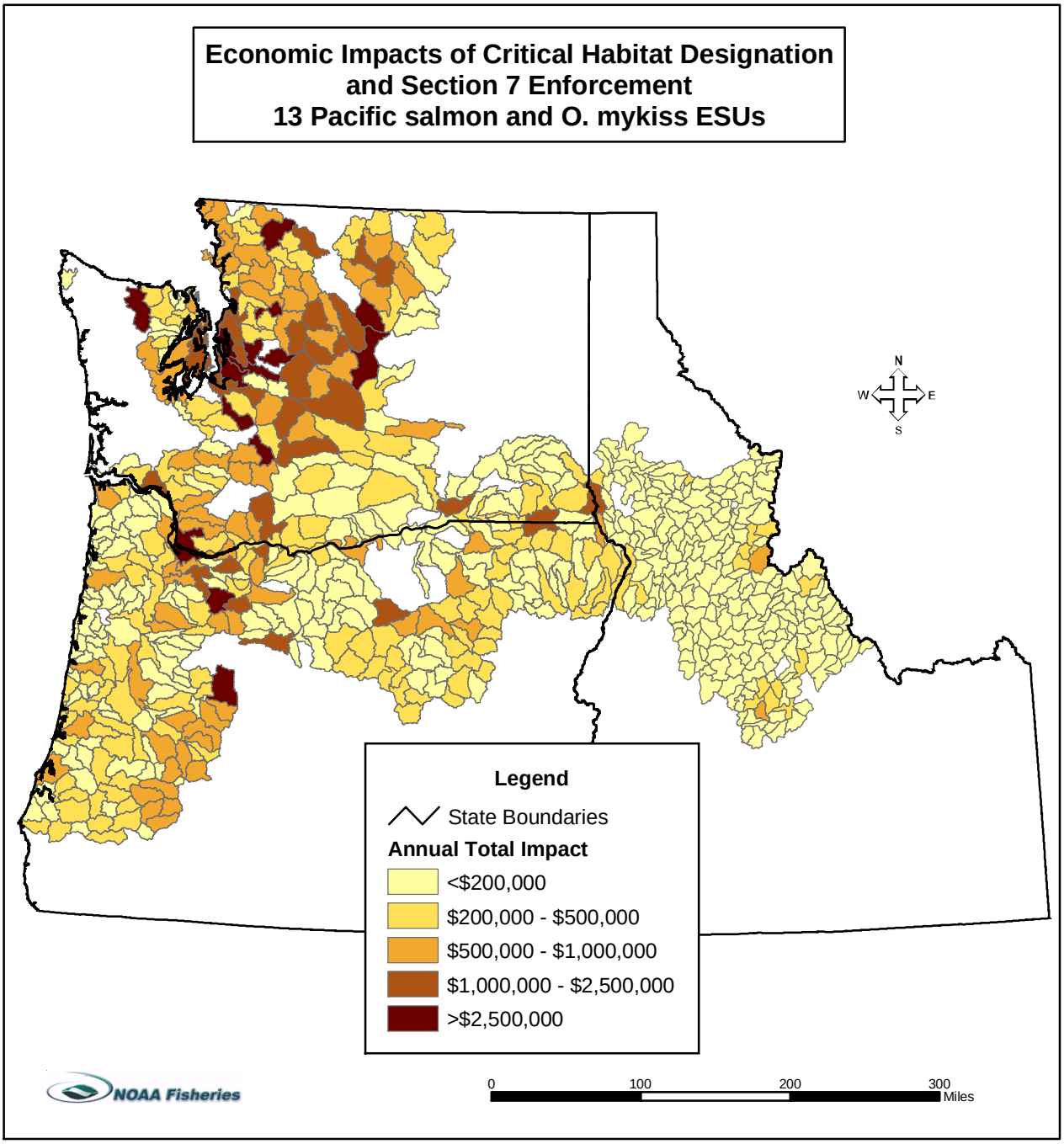
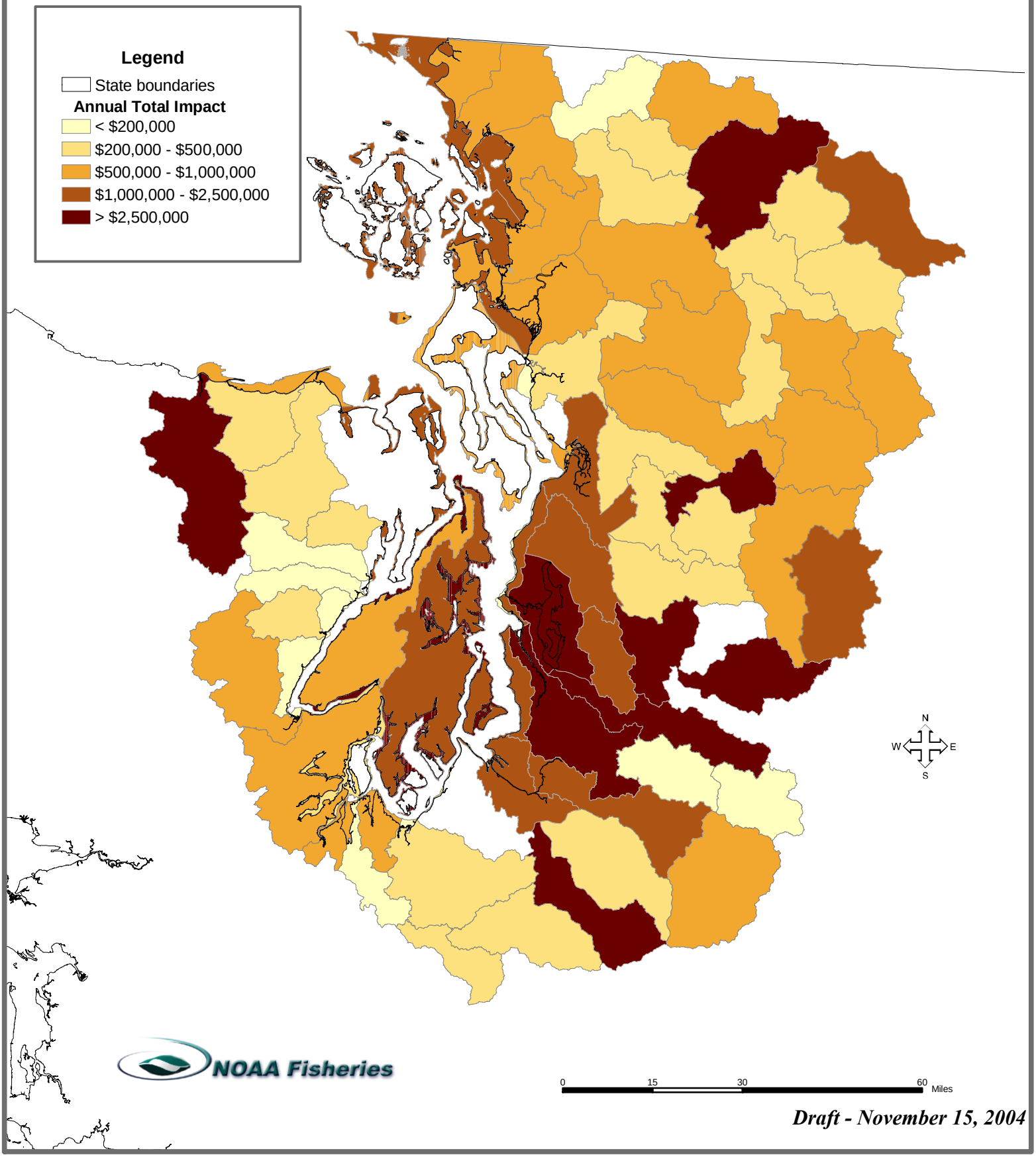
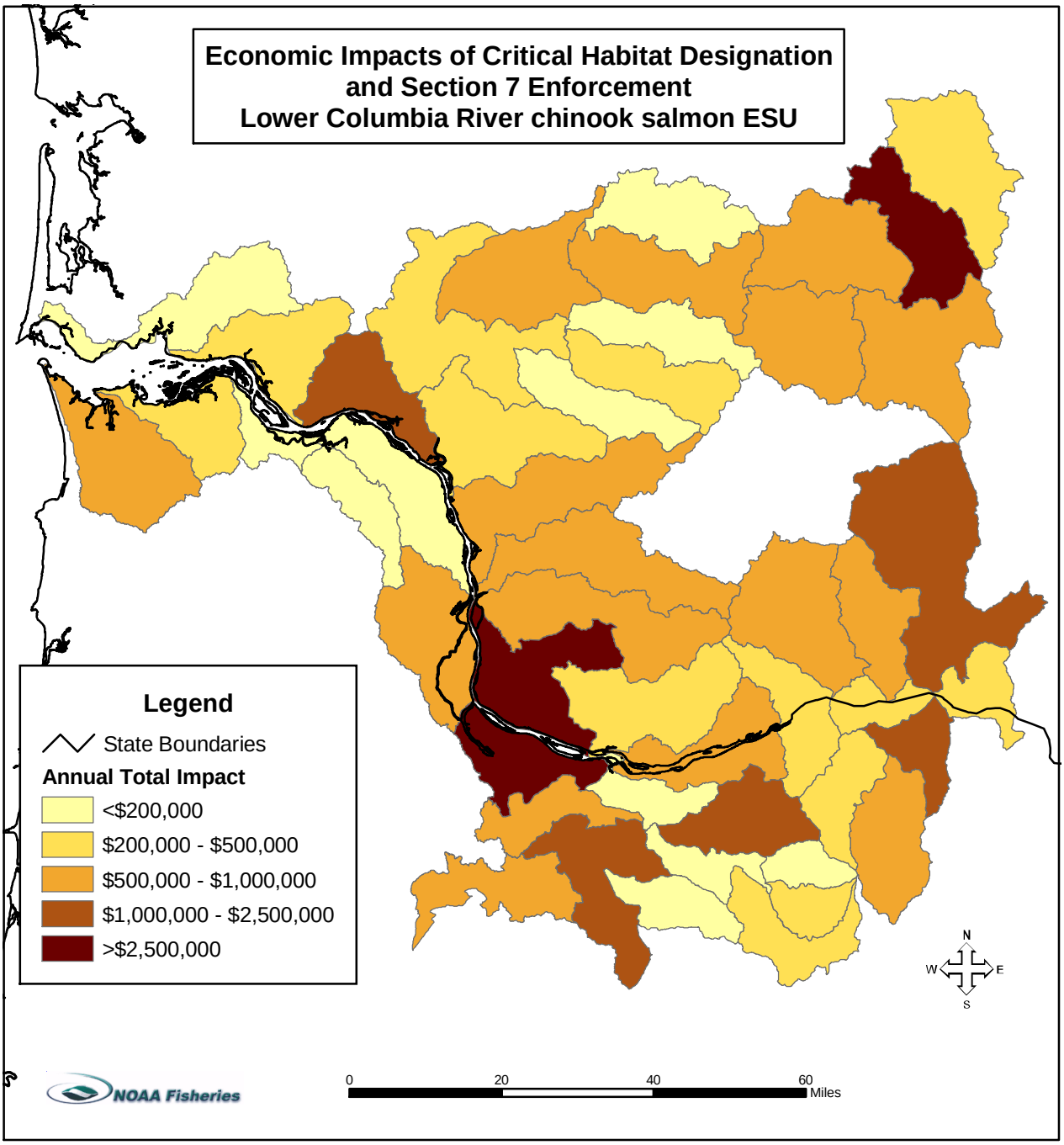

Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
13 Pacific salmon and O. mykiss ESUs
N
W
E
S
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
NOAA Fisheries
0
100
200
300
Miles

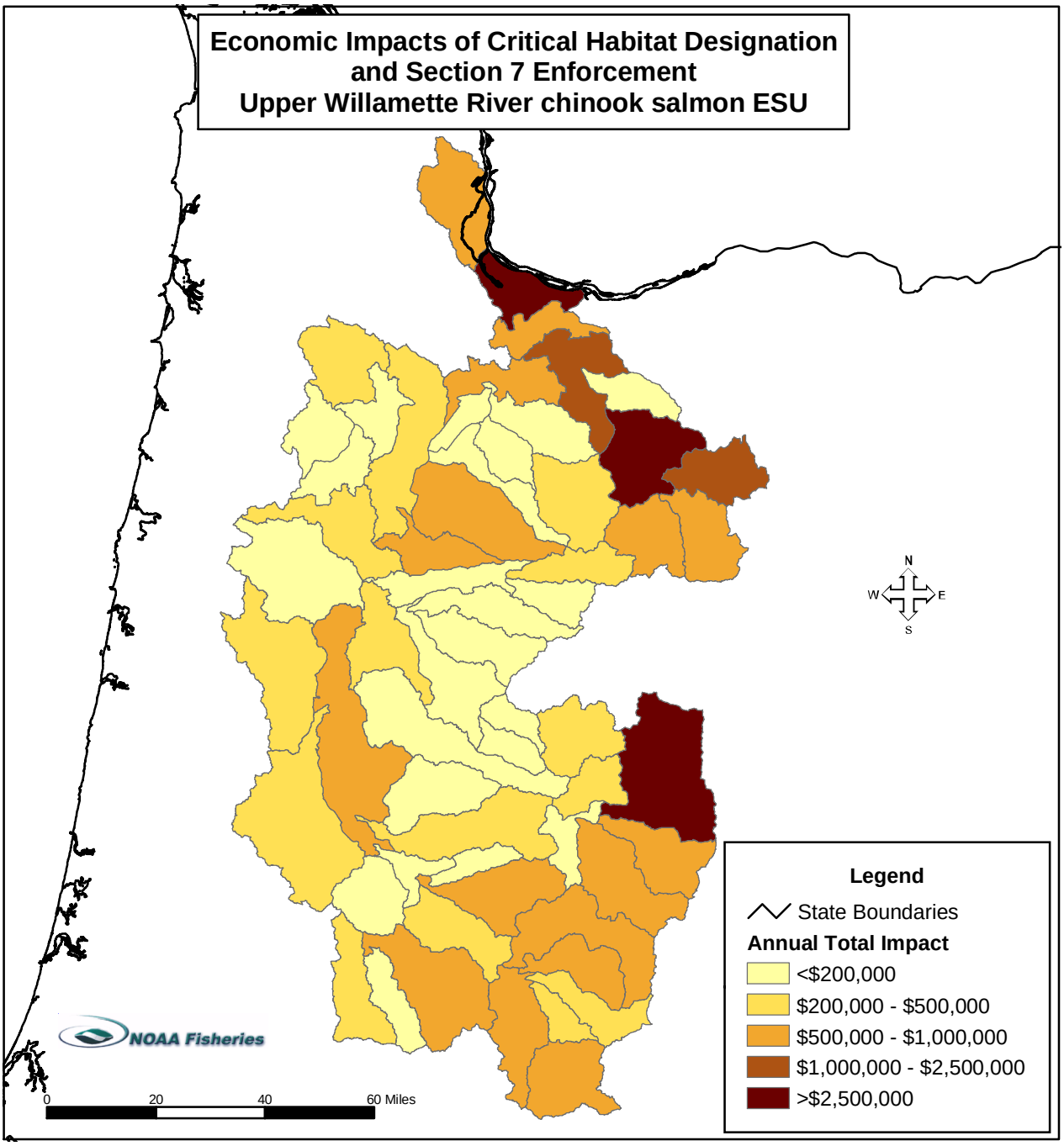
Figure 16

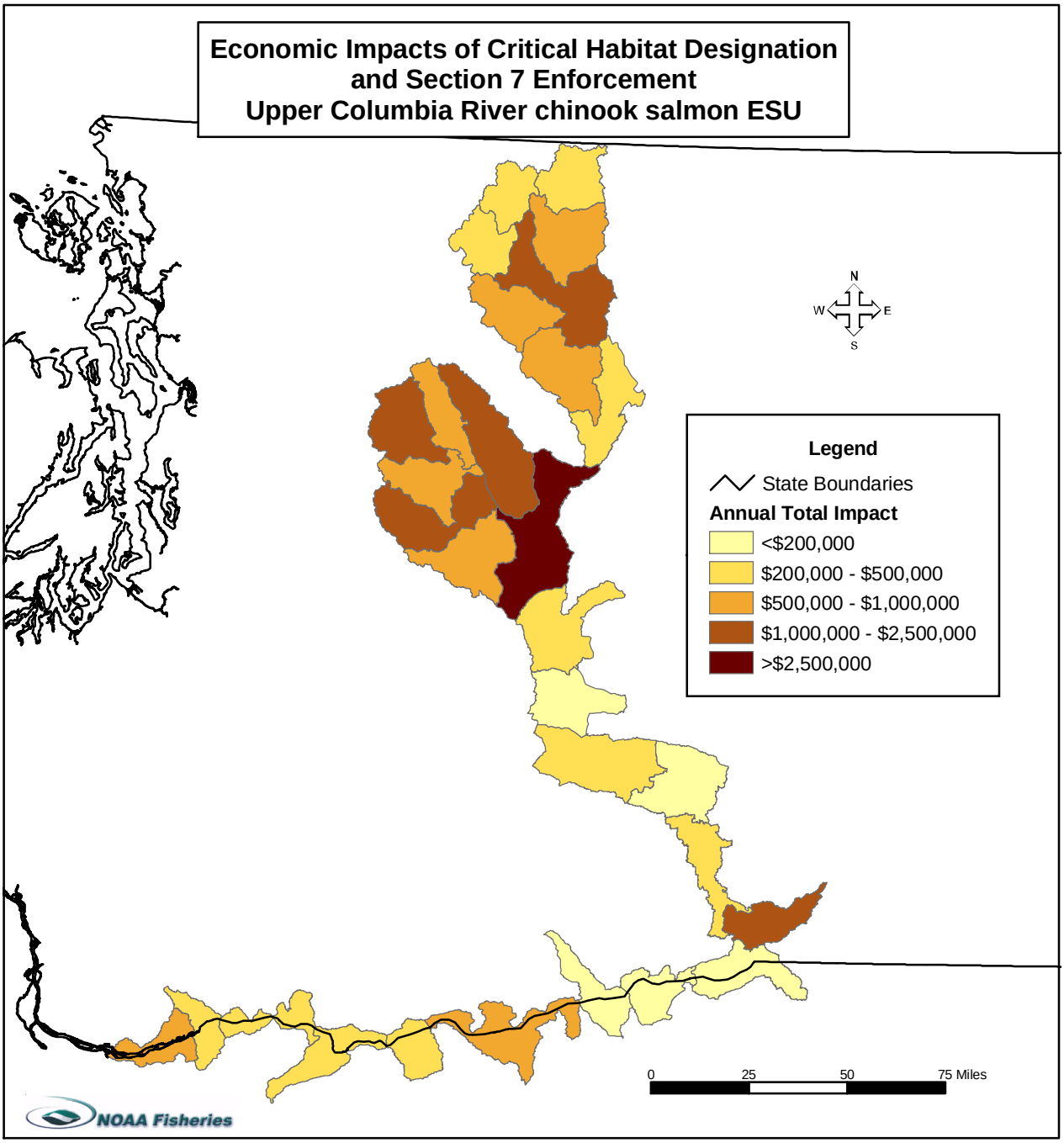
Economic Impacts of Critical Habitat Designation and Section 7 Enforcement Puget Sound chinook salmon ESU



Draft - November 15, 2004


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Lower Columbia River chinook salmon ESU
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
N
W
E
S
NOAA Fisheries
0
20
40
60
Miles


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Upper Willamette River chinook salmon ESU
N
W
E
S
NOAA Fisheries
0
20
40
60 Miles
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Upper Columbia River chinook salmon ESU
N
W
E
S
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
0
25
50
75 Miles
NOAA Fisheries

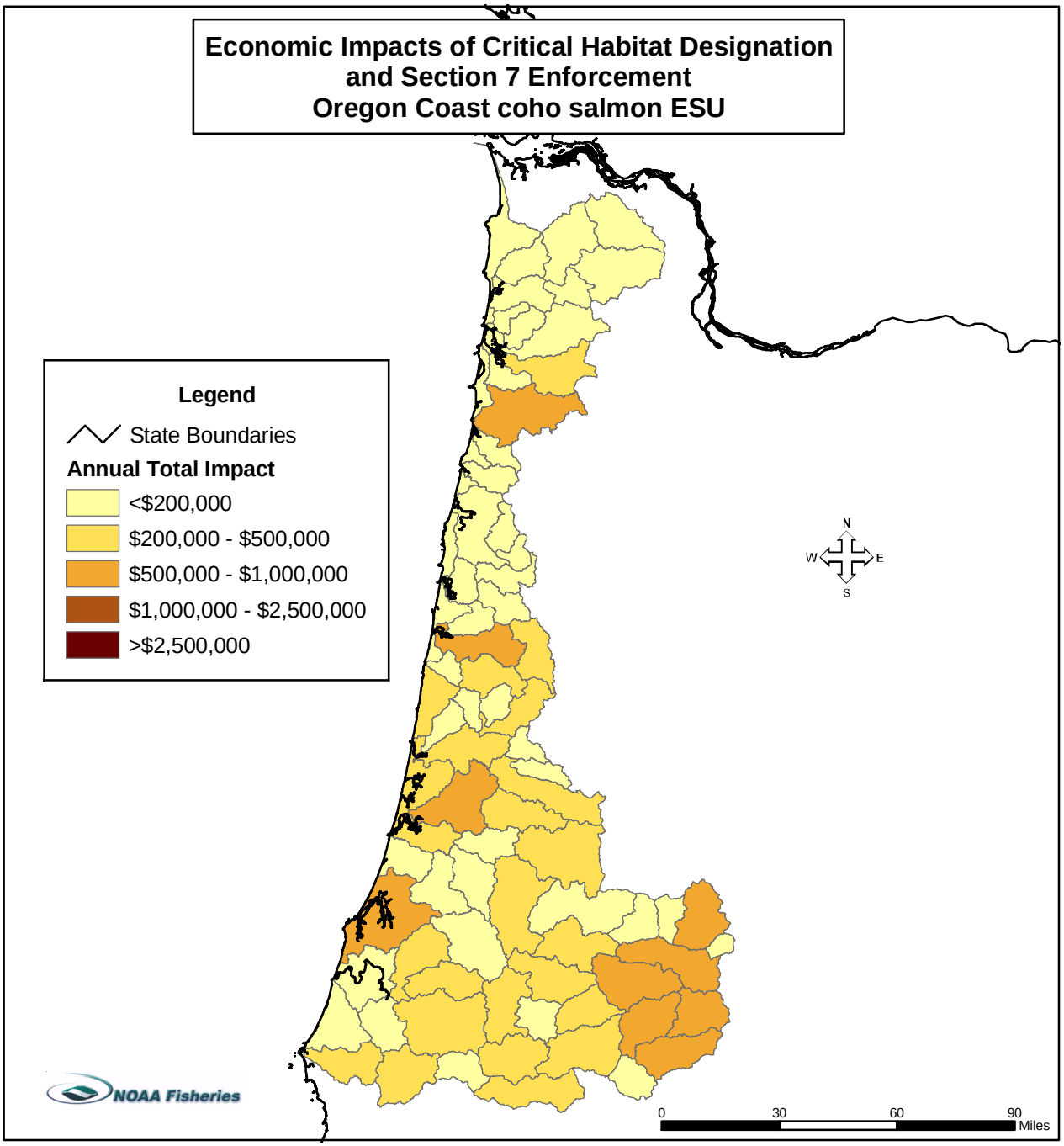
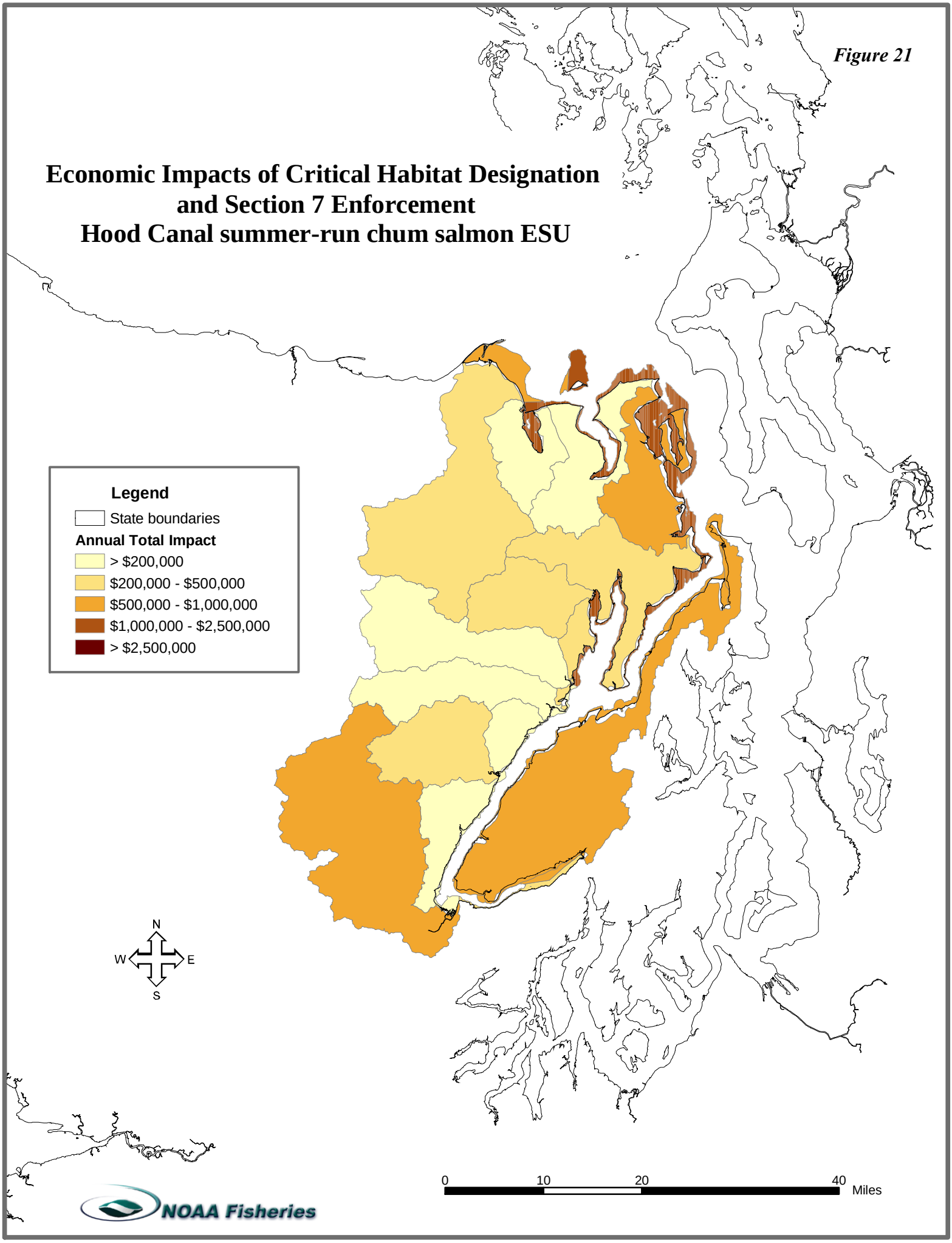

Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Oregon Coast coho salmon ESU
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
N
W
E
S
NOAA Fisheries
0
30
60
90
Miles

Figure 21

Economic Impacts of Critical Habitat Designation and Section 7 Enforcement
Hood Canal summer-run chum salmon ESU



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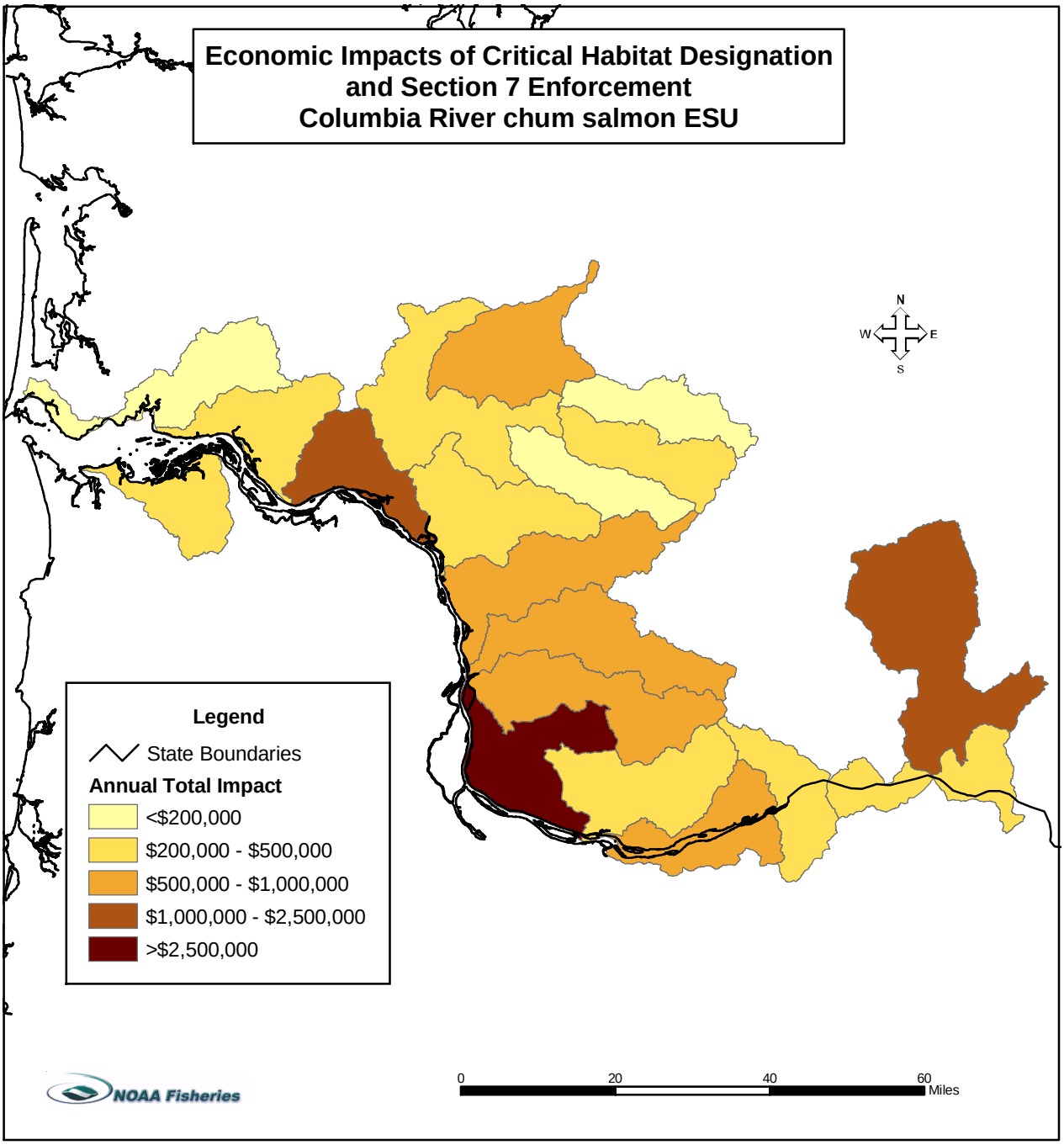
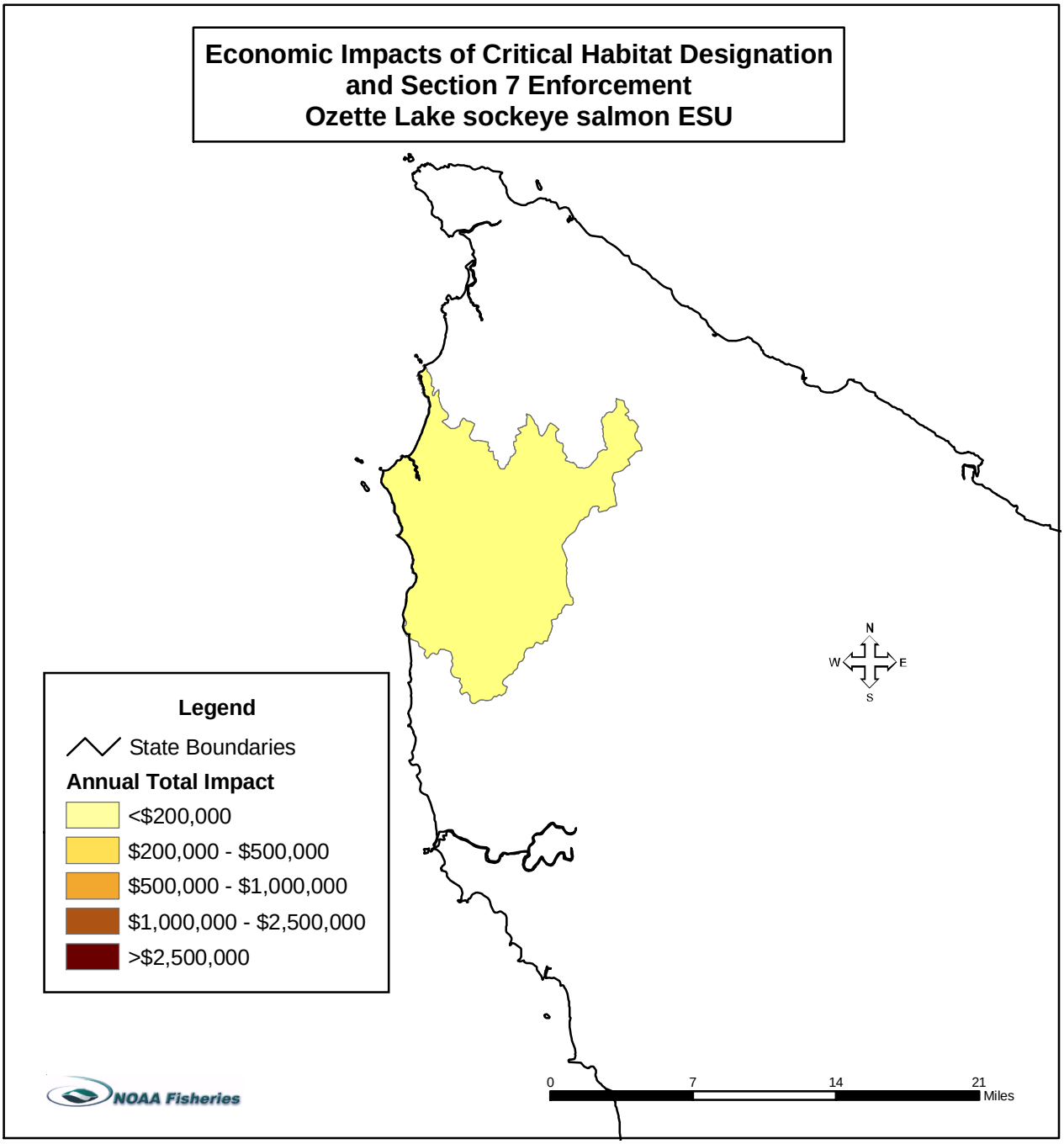
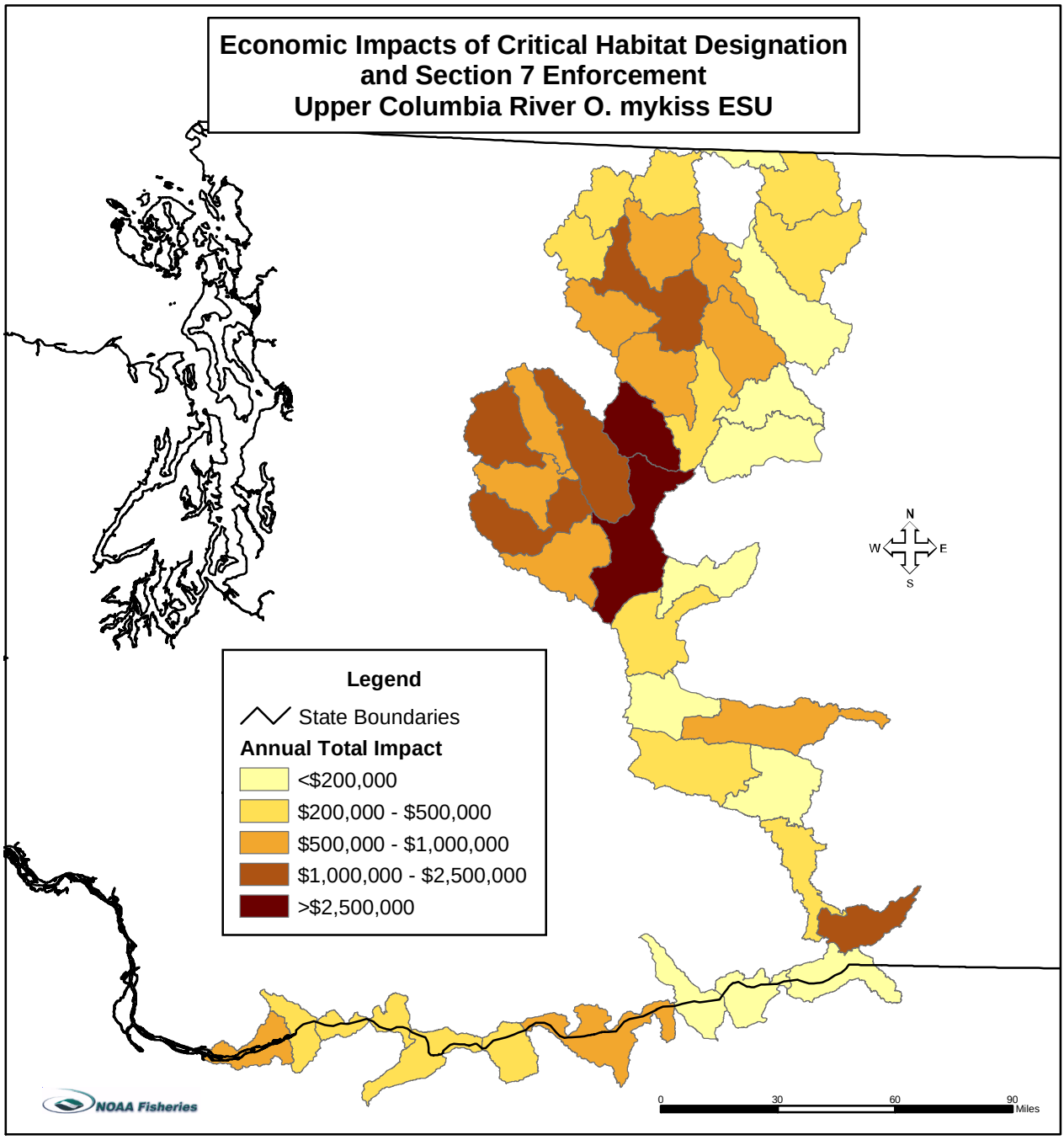
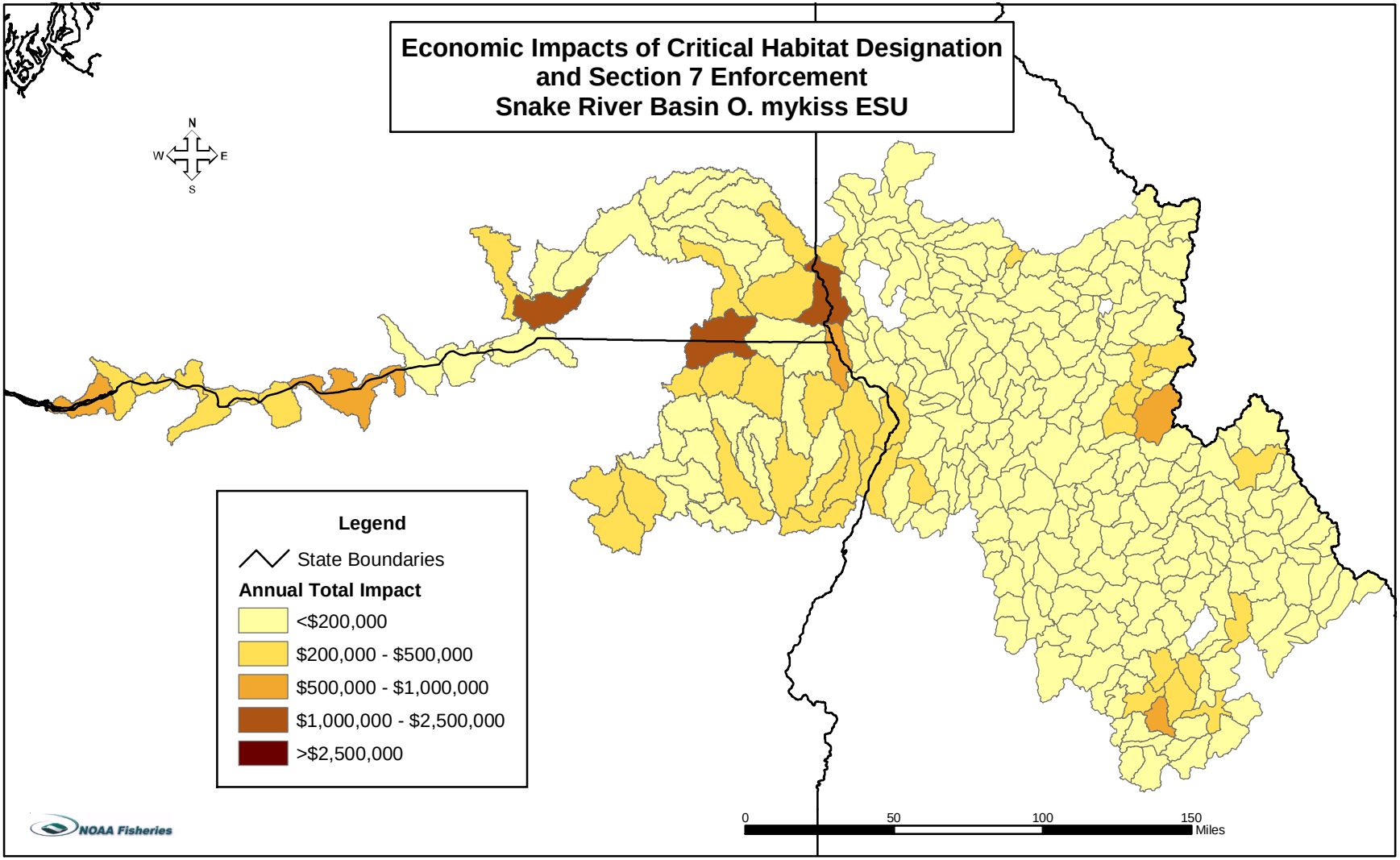
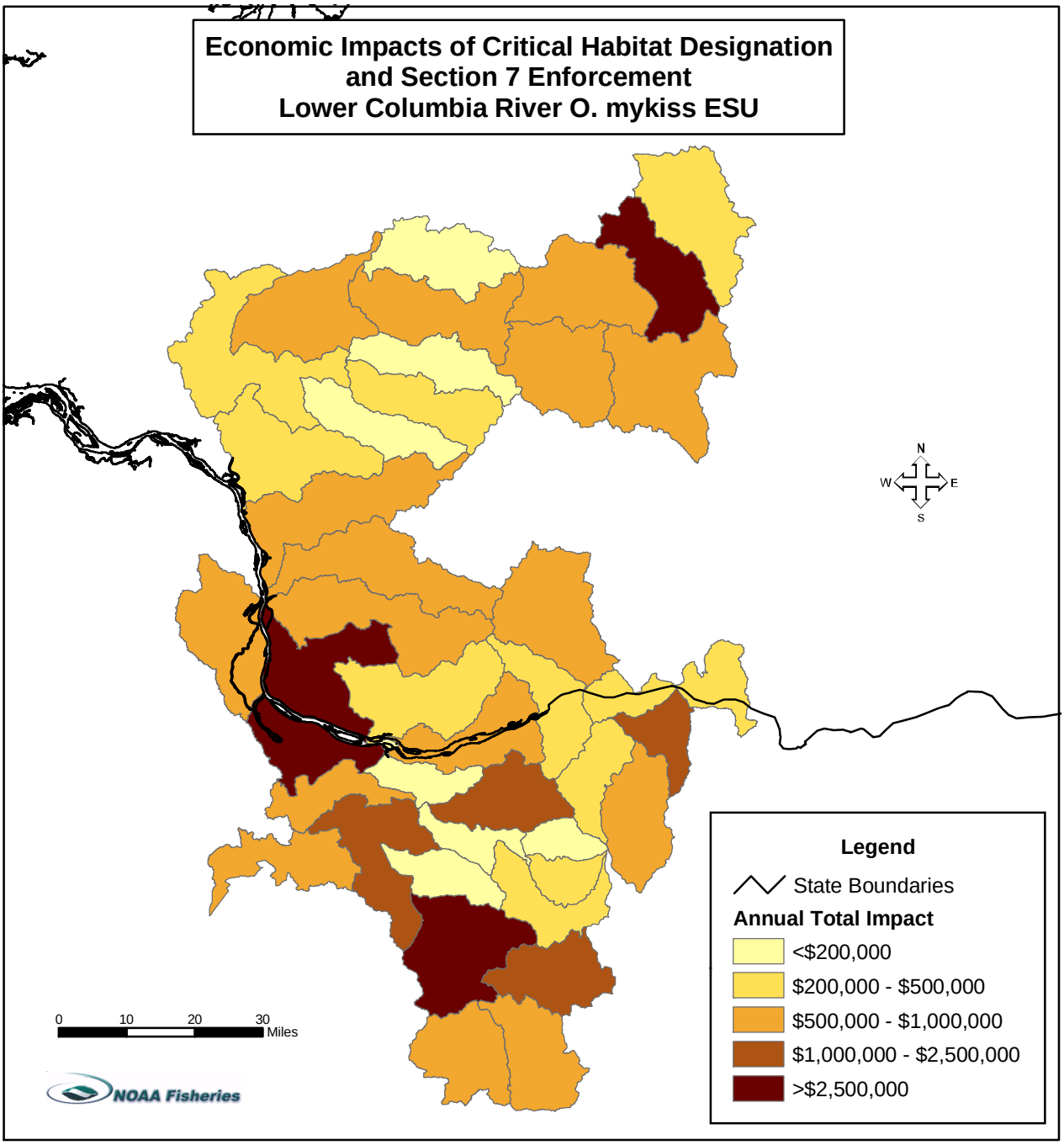
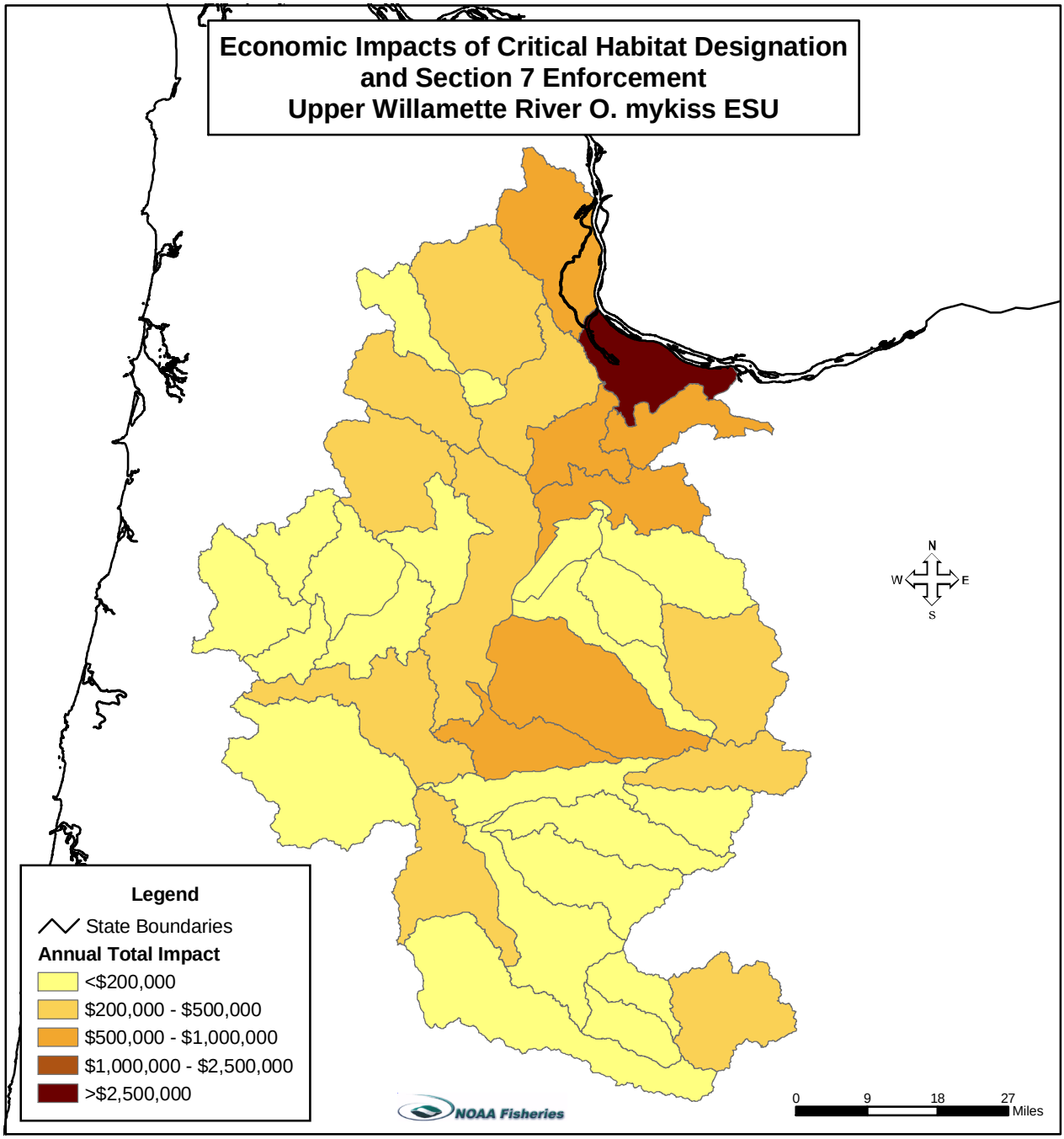

Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Columbia River chum salmon ESU
N
W
E
S
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
NOAA Fisheries
0
20
40
60
Miles

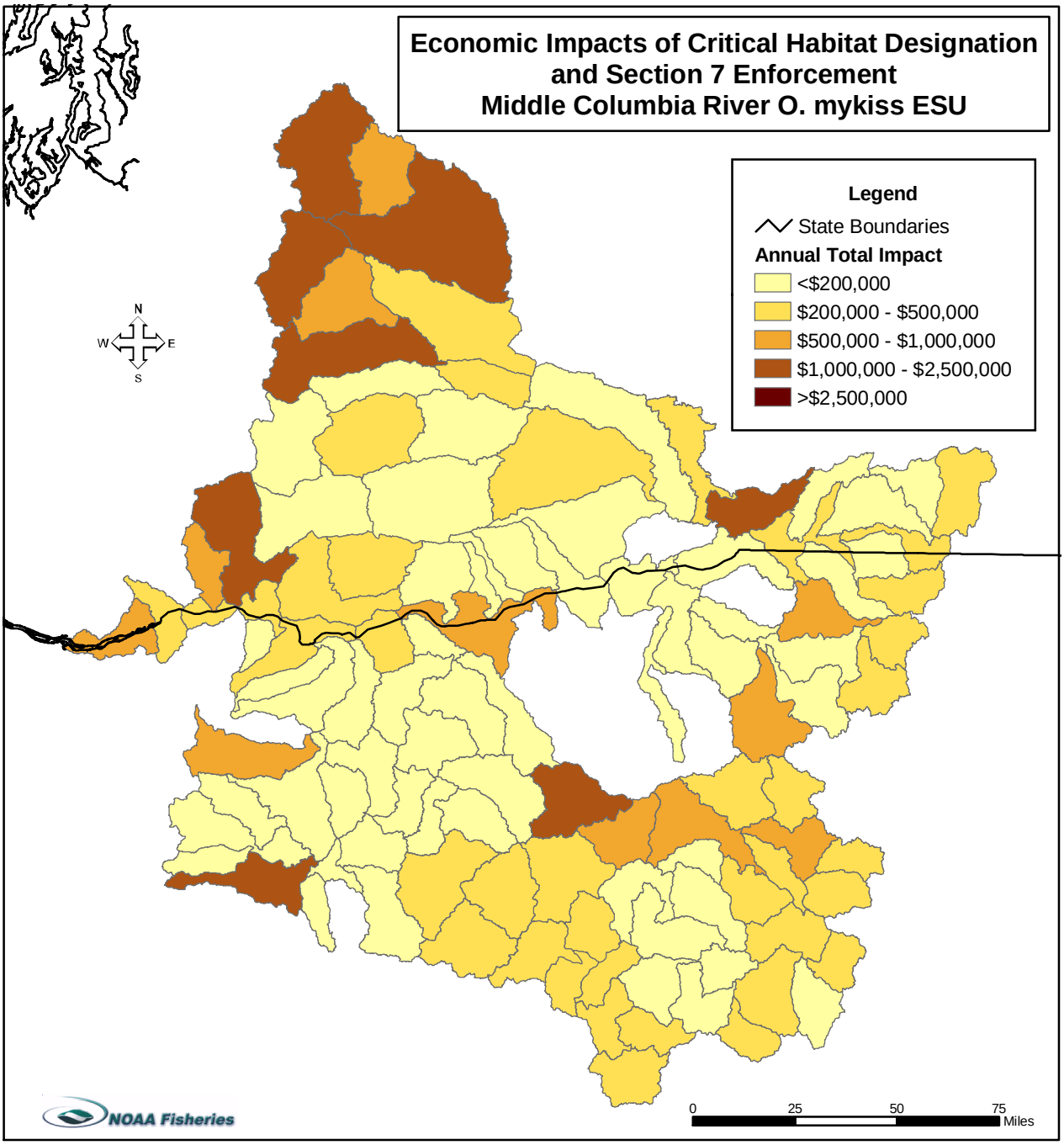

Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Ozette Lake sockeye salmon ESU
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
N
W
E
S
0
7
14
21
Miles
NOAA Fisheries


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Upper Columbia River O. mykiss ESU
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
N
W
E
S
NOAA Fisheries
0
30
60
90
Miles


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Snake River Basin O. mykiss ESU
N
W
E
S
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
NOAA Fisheries
0
50
100
150
Miles


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Lower Columbia River O. mykiss ESU
N
W
E
S
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
0
10
20
30
Miles
NOAA Fisheries


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Upper Willamette River O. mykiss ESU
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
NOAA Fisheries
N
W
E
S
0
9
18
27
Miles


Economic Impacts of Critical Habitat Designation
and Section 7 Enforcement
Middle Columbia River O. mykiss ESU
Legend
State Boundaries
Annual Total Impact
<$200,000
$200,000 - $500,000
$500,000 - $1,000,000
$1,000,000 - $2,500,000
>$2,500,000
N
W
E
S
NOAA Fisheries
0
25
50
75
Miles