Appendix P

Fish

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Introduction

This appendix provides tabular data on the location and status of state and federally listed fish species, species of concern, and salmon stocks (Tables P-1, P-2, and P-3). Maps are provided showing essential habitat for Chinook spawning, coho summer rearing, coho winter rearing, steelhead rearing, bull trout, and Lake Ozette sockeye salmon; as identified using intrinsic potential models (Chinook, coho, steelhead) or United States Fish and Wildlife Service critical habitat designations (bull trout, Lake Ozette sockeye).

Fish Status

Both federal and state governments have programs to identify species in need of protection or special management consideration. For example, a species may be listed as "threatened" or "endangered" under the federal Endangered Species Act. An "endangered" species is one that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is one that is likely to become endangered within the foreseeable future. While the term "species" is often used, listings for vertebrates (including fish) under the Endangered Species Act may be applied at a variety of taxonomic scales, including an entire species, a sub-species, or a subset of a population known as a "distinct population segment". A distinct population segment (DPS) is one that is discrete from other populations of the species and considered significant in relation to the entire species.

No distinct population segments within the OESF are currently listed as endangered under the Endangered Species Act. One distinct population segment, the southern DPS Eulachon (*Thaleichthys pacificus*, also known as "Columbia River smelt") is listed as threatened (76 FR 65324). Eulachon, however, are not common in the OESF and have only been occasionally or anecdotally observed in the Queets River (Gustafson and others 2010). As their namesake implies, the highest incidence of Eulachon spawning within Washington occurs in the Columbia River Basin.

Fisheries management of salmon is often reported by "stocks." The term "stock" refers to fish spawning in a particular lake or stream at a particular season, such as "Bogachiel summer Chinook" or "Sekiu fall coho." Fish in a given stock do not interbreed with stocks from other locations, nor with those that spawn in the same location but at different seasons. For the purpose of listing under the Endangered Species Act, salmon must be part of an evolutionarily significant unit (ESU). As with stocks, ESUs are reproductively isolated, but under the Endangered Species Act have the additional requirement that they represent an important component in the evolutionary legacy of the species. As a result, an ESUt is typically comprised on many stocks.

No ESUs within the OESF are currently listed as endangered under the Endangered Species Act. Two are currently listed as threatened: Coastal-Puget Sound ESU bull trout (64 FR 58909), Lake Ozette ESU sockeye (64 FR 14528) (refer to Table P-1).

An additional informal category known as federal "species of concern" refers to species which the federal government believes might be in need of concentrated conservation actions. Federal "species of concern" receive no legal protection and the use of the term does not necessarily mean that the species will eventually be listed as threatened or endangered. Within the OESF, federal species of concern include the northern DPS green sturgeon (*Acipenser medirostris*), the Pacific lamprey (*Lampetra tridentata*), and the river lamprey (*Lampetra ayresi*).

At the state level, the Washington Department of Fish and Wildlife (WDFW) oversees the listing and recovery of species in need of protection. Several designations are used, including "endangered," "threatened," "sensitive," and "candidate." No fish species within the OESF are currently designated as threatened or endangered under state definitions. One species, the Olympic mudminnow (*Novumbra hubbsi*) is designated as "state sensitive." A state sensitive species is one that is vulnerable or declining and is likely to become threatened or endangered throughout a significant portion of its range within the state without cooperative management or removal of threats (WAC 232-12-297). A state candidate species is one that the state is considering for designation as endangered, threatened, or sensitive. State candidate species within the OESF include bull trout, Eulachon, river lamprey, and Lake Ozette sockeye salmon.

Table P-1. Federally and State Listed Fish Species Within the OESF, Including Candidate Species and Species of Concern

Species	Scientific name	DPS or ESU	Federal status	State status
Eulachon	*Thaleichthys pacificus*	Southern DPS	Threatened	Candidate
Bull trout	*Salvelinus confluentus*	Coastal-Puget Sound ESU	Threatened	Candidate
Sockeye salmon	*Oncorhynchus nerka*	Lake Ozette ESU	Threatened	Candidate
Green sturgeon	*Acipenser medirostris*	Northern DPS	Species of concern	
Pacific lamprey	*Lampetra tridentata*		Species of concern	
River lamprey	*Lampetra ayresi*		Species of concern	Candidate
Olympic mudminnow	*Novumbra hubbsi*			Sensitive

While individual salmon stocks are not eligible for listing under the Endangered Species Act, information on their status is available from a variety of sources. Collectively, WDFW and Washington Tribes maintain the Salmon and Steelhead Inventory (SaSI). The 2002 SaSI identified 67 salmon stocks within the OESF and provided a scientific determination of each stock as "healthy," "depressed," "critical," "extinct," or "unknown."[1] In addition, the Washington State Legislature authorized the development of habitat limiting factors reports describing the factors limiting salmon habitat within the state (Engrossed Substitute House Bill 2496 and Second Engrossed Second Substitute Senate Bill 5596, now 77RCW). Data on the status of individual salmon stocks within the OESF from habitat limiting factors reports and the 2002 SaSI are summarized in Table P-2.

Table P-2. Current Status of Individual Salmon Stocks Within the OESF

Location	Stock	Status	Source
Calawah	Chinook (summer)	Critical	NOPLE (2004)
		Threatened	McHenry and others (1996) as cited in Smith (2000)
Waatch complex (Waatch, Waatch Cr, Petroleum, Sooes)	Chum (unspecified)	Critical	NOPLE (2004)

Location	Stock	Status	Source
Sooes	Chum (fall)	Critical	McHenry and others (1996) as cited in Smith (2000)
	Cutthroat (unspecified)	Depressed	NOPLE (2004)
Ozette [River basin]	Chinook (fall)	Critical	NOPLE (2004), McHenry and others (1996) as cited in Smith (2000)
	Coho (fall)	Depressed	NOPLE (2004)
	Coho (unspecified)	Threatened	McHenry and others (1996) as cited in Smith (2000)
	Chum (fall)	Critical	NOPLE (2004)
		Threatened	McHenry and others (1996) as cited in Smith (2000)
	Sockeye	Critical	NOPLE (2004), McHenry and others (1996) as cited in Smith (2000)
	Steelhead (winter)	Depressed	NOPLE (2004)
Sekiu [River basin]	Chinook (summer/fall)	Critical	NOPLE (2004)
	Chinook (unspecified)	Critical	Smith (1999)
	Coho (fall)	Depressed	NOPLE (2004)
	Coho (unspecified)	Depressed	Smith (1999)
	Chum (fall)	Critical	NOPLE (2004)
	Steelhead (winter)	Depressed	NOPLE (2004)
Sail	Coho (unspecified)	Depressed	Smith (1999)
Hoko [River basin]	Chinook (summer)	Depressed	NOPLE (2004)
	Chinook (fall)	Depressed	NOPLE (2004), SaSI (2002)
	Coho (fall)	Depressed	NOPLE (2004)
	Chum (fall)	Critical	NOPLE (2004)
	Cutthroat (unspecified)	Depressed	NOPLE (2004)
Clallam [River basin]	Coho (fall)	Depressed	NOPLE (2004)
	Chum (fall)	Depressed	NOPLE (2004)
	Steelhead (winter)	Depressed	NOPLE (2004)
	Chinook (unspecified)	Critical	Smith (1999)
Pysht [River basin]	Chinook (summer/fall)	Critical	NOPLE (2004)
	Chinook (unspecified)	Critical	Smith (1999)
	Coho (fall)	Depressed	NOPLE (2004)
	Coho (unspecified)	Depressed	Smith (1999)
	Chum (fall)	Depressed	NOPLE (2004)
Deep [Creek basin]	Coho (fall)	Depressed	NOPLE (2004)
	Coho (unspecified)	Depressed	Smith (1999)

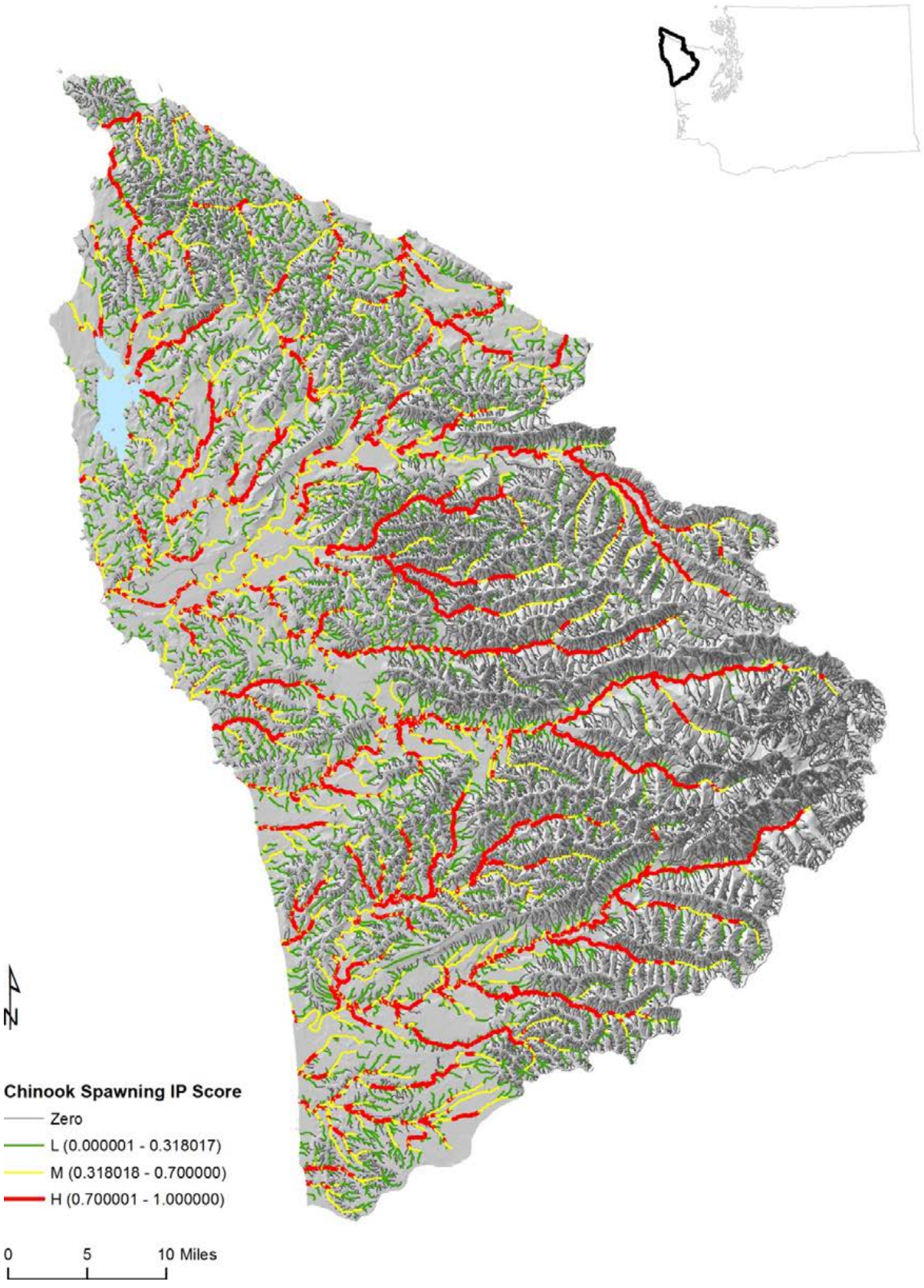
Location	Stock	Status	Source
	Chum (fall)	Critical	NOPLE (2004)
		Depressed	SaSI (2002)
	Chum (unspecified)	"from 1994-1998, … declined to less than 50 adults per year"	Mike McHenry (Lower Elwah Tribe, personal communication) as cited in Smith 1999
Western Strait [of Juan de Fuca] independents (Coville Creek to Village Creek)	Coho (fall)	Critical	NOPLE (2004)
	Chum (fall)	Critical	NOPLE (2004)
	Steelhead (winter)	Depressed	NOPLE (2004)
Quillayute Mainstem	Chinook (summer)	Critical	NOPLE (2004)
		Threatened	McHenry and others (1996) as cited in Smith (2000)
Bogachiel	Chinook (summer)	Threatened	McHenry and others (1996) as cited in Smith (2000)
Soleduck	Coho (summer)	Threatened	McHenry and others (1996) as cited in Smith (2000)
Queets	Chinook (spring/summer)	Depressed	WDFW and WWTIT 1994; Nehlsen and others (1991) as cited in Smith (2001), SaSI (2002)
Clearwater	Chinook (spring/summer)	Critical	SaSI (2002)

Table P-3. Definitions of Fish Stock Status[a]

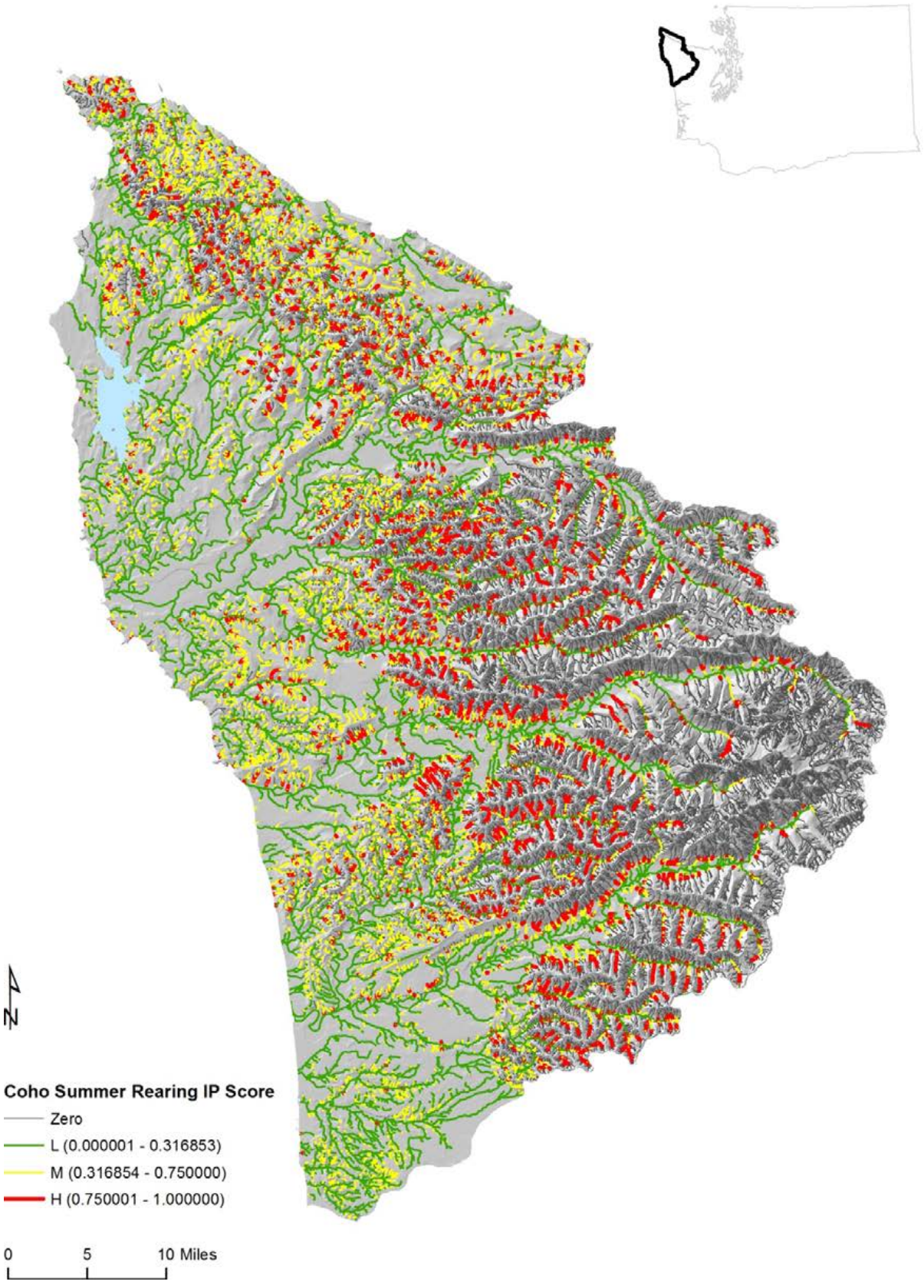
Status	Definition
Critical stocks	Stocks that have declined to the point that the stocks are in danger of significant loss of genetic diversity, or are at risk of extinction.
Depressed	A depressed stock is one whose production is below expected levels, based on available habitat and natural variation in survival rates, but above where permanent damage is likely. 22percent of stocks were determined to be depressed.
Unknown	For many stocks, there simply is insufficient information to rate them. Many of these are historically small populations and could be especially vulnerable to any negative impacts. There is an immediate need to collect more information on them.

[a]Source: Washington Department of Fish and Wildlife 2012

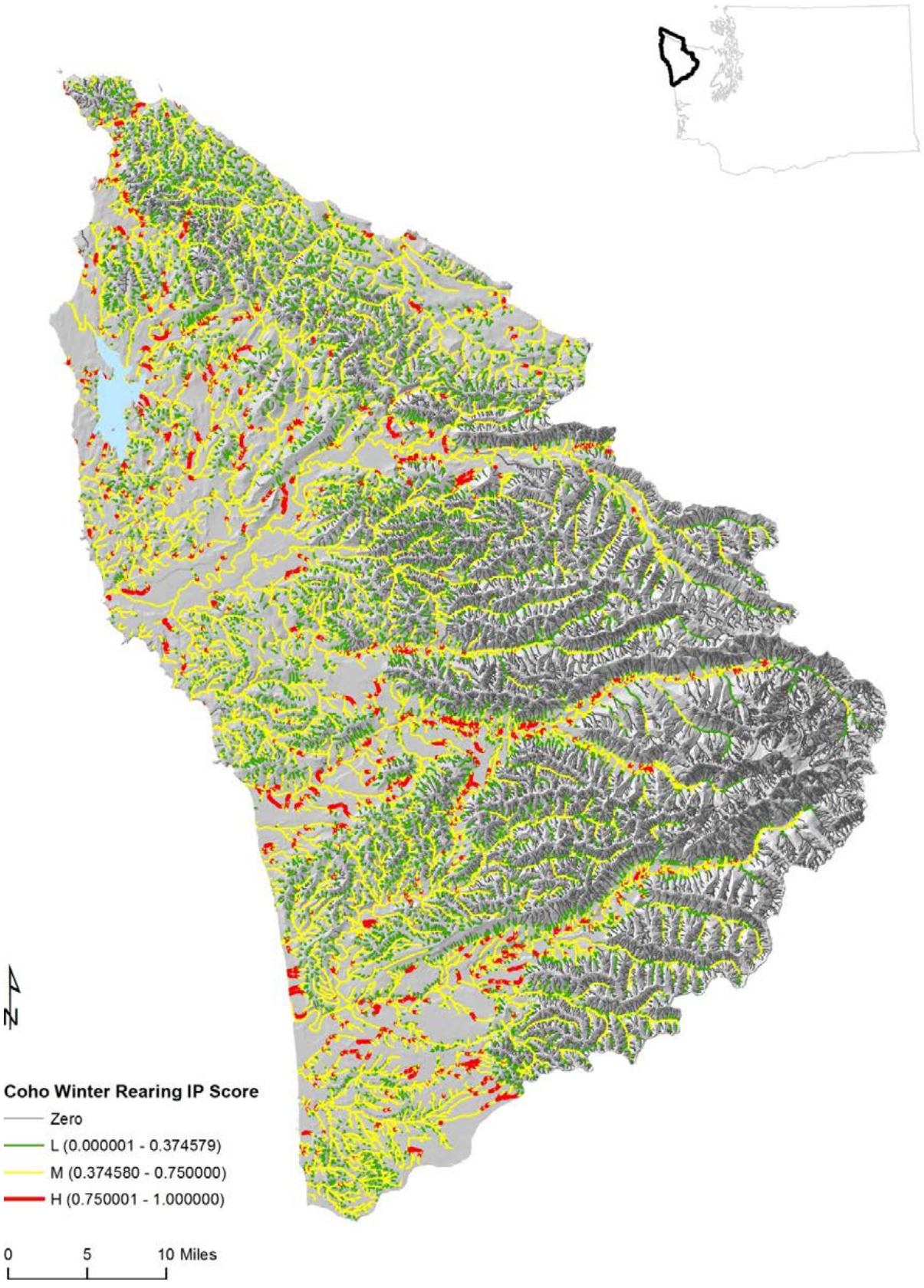
Map P-1. Chinook Spawning Intrinsic Potential (Adapted From Bennett and Wecker 2013)



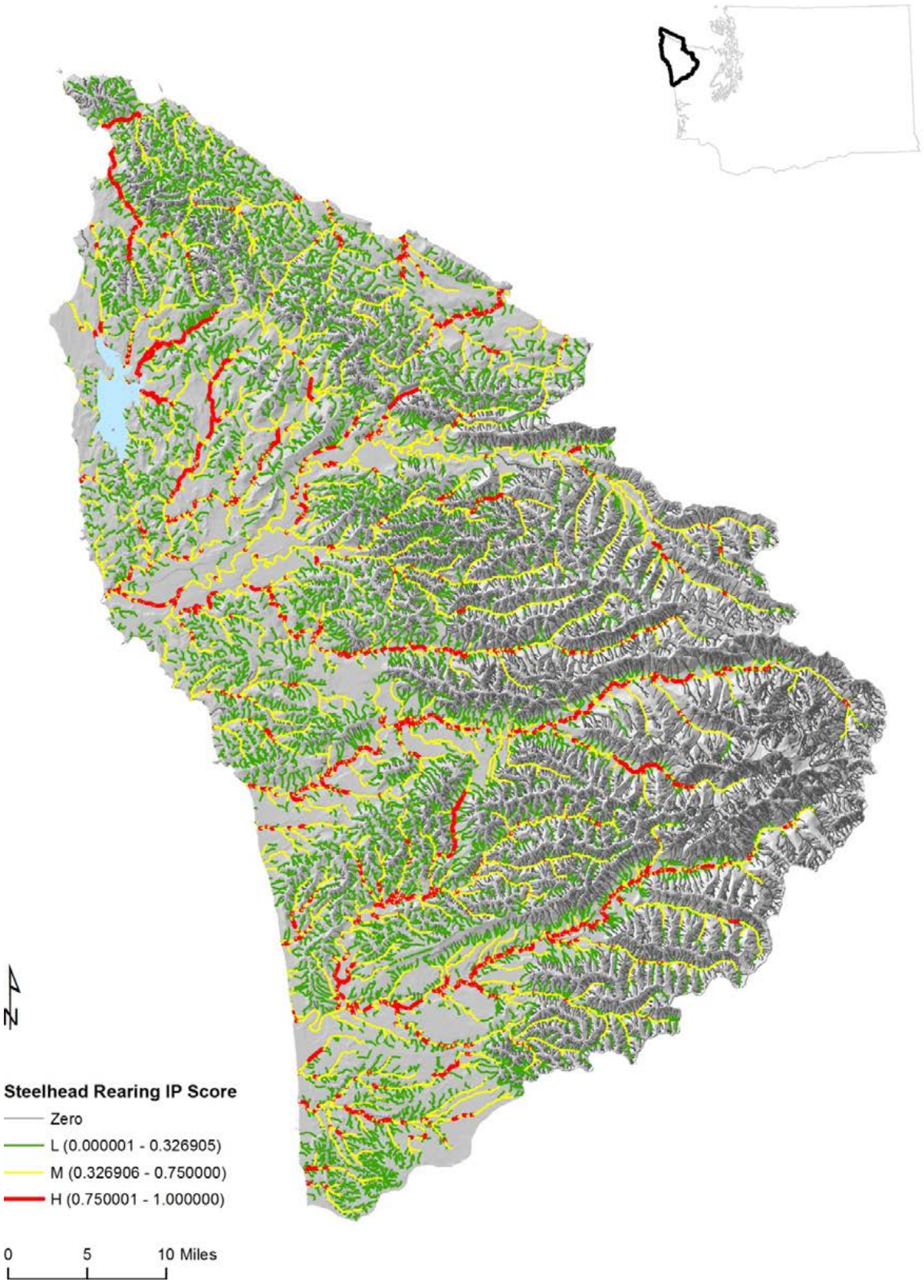
Map P-2. Coho Summer Rearing Intrinsic Potential (Adapted From Bennett and Wecker 2013)



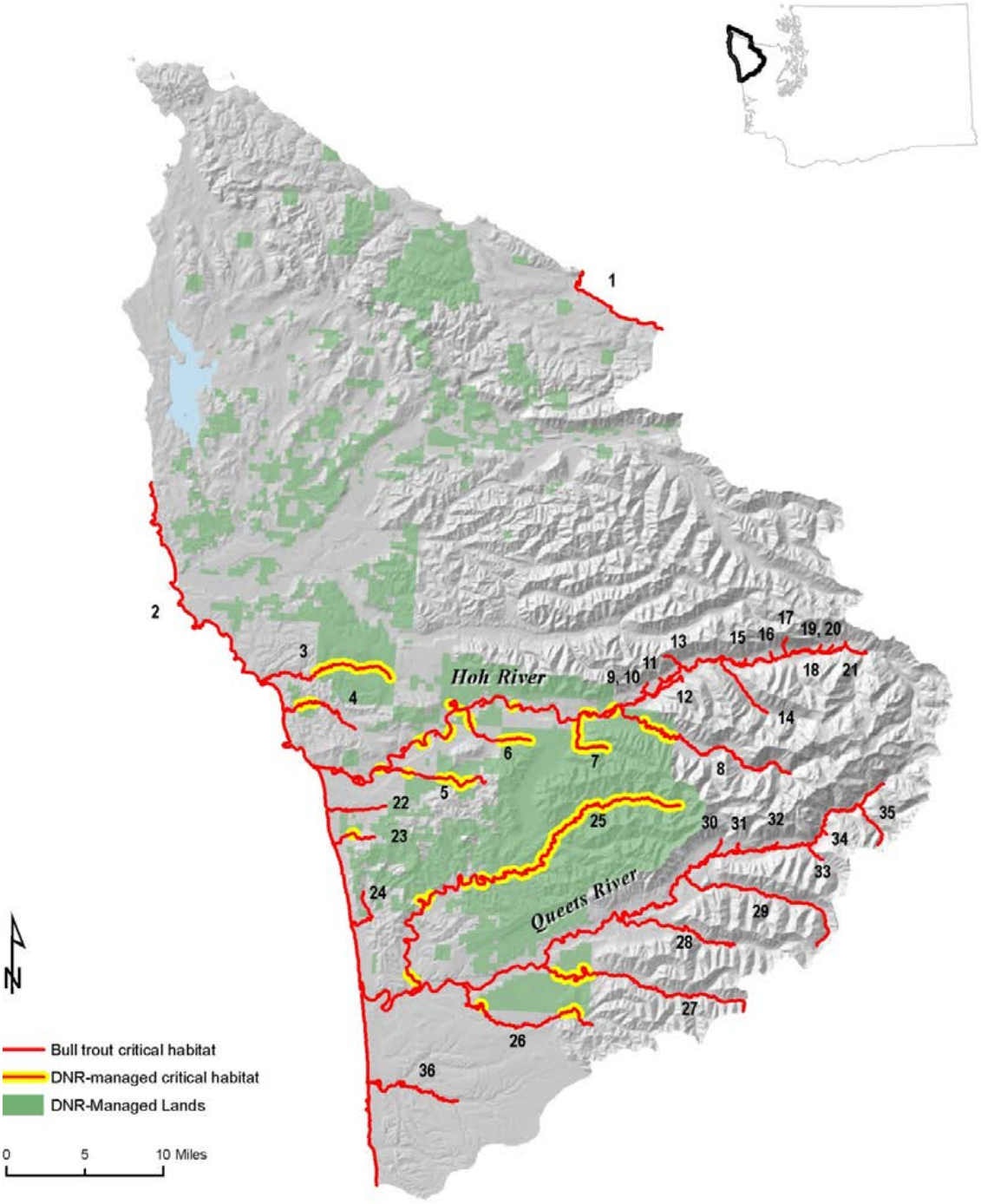
Map P-3. Coho Winter Rearing Intrinsic Potential (Adapted From Bennett and Wecker 2013)



Map P-4. Steelhead Rearing Intrinsic Potential (Adapted From Bennett and Wecker 2013)

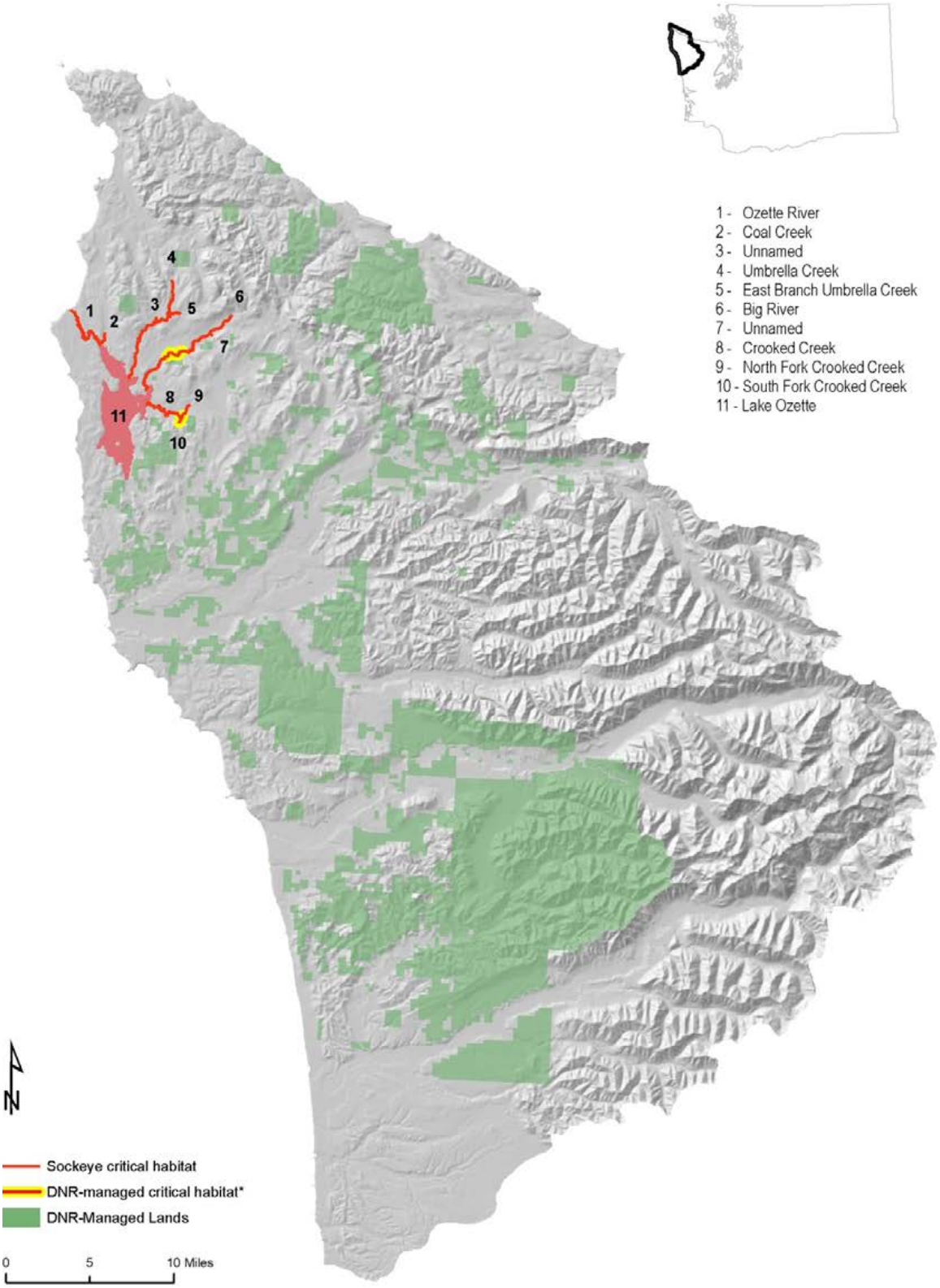


Map P-5. Bull Trout Coastal-Puget Sound ESU Critical Habitat Within the OESF (Proposed Under 75 FR 2270)



1 - Strait of Juan de Fuca Marine
2 - Pacific Coast Marine
3 - Goodman Creek
4 - Mosquito Creek
5 - Nolan Creek
6 - Winfield Creek
7 - Owl Creek
8 - South Fork Hoh River
9 - Twin Creek
10 - East Twin Creek
11 - Snider Creek
12 - Unnamed trib. (#0509)
13 - Taft Creek
14 - Mount Tom Creek
15 - Cougar Creek
16 - Unnamed trib. (#0527)
17 - Clide Creek
18 - OGS Creek
19 - Hoh Creek
20 - Slide Creek
21 - Unnamed trib (#0542)
22 - Cedar Creek
23 - Steamboat Creek
24 - Kalaloch Creek
25 - Clearwater River
26 - Salmon River
27 - Matheny Creek
28 - Sams River
29 - Tshletshy Creek
30 - Harlow Creek
31 - Bob Creek
32 - Paradise Creek
33 - Alta Creek
34 - Hee Hee Creek
35 - Hee Haw Creek
36 - Raft River

Map P-6. Lake Ozette Sockeye ESU Critical Habitat Within the OESF (Proposed Under 75 FR 2270)



* Areas on DNR-managed lands were identifiifed as critical habitat, but were exempted from the designation due to DNR's Habitat Conservation Plan

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[1] The Salmon and Steelhead Inventory defines a **healthy** stock as robust. A **depressed** stock is one whose numbers are below expected levels, but sufficient to avoid permanent damage. A **critical** stock is one that has declined to the point that it is in danger of significant loss of genetic diversity or is at risk of extinction. An **extinct** stock is one that is no longer present in its original range.