APPENDIX A

IDENTIFICATION AND DESCRIPTION OF ESSENTIAL FISH HABITAT, ADVERSE IMPACTS, AND RECOMMENDED CONSERVATION MEASURES FOR SALMON

AMENDMENT 14 TO THE PACIFIC COAST SALMON PLAN

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August 1999

ACKNOWLEDGMENTS

The primary drafting of this document was accomplished by Ms. Nora Berwick, Dr. John Coon, Mr. Mark Helvey, Mr. Stephen Phillips, Ms. Fran Recht, Mr. Phil Roni, Mr. Joe Scordino, and Mr. Lawrence Six. Additional contributions were provided by Dr. Robert Kope and Dr. Gary Morishima. Final compilation and editing were done by Ms. Berwick and the Pacific Fishery Management Council staff: Dr. Coon, Ms. Renee Heyden, Ms. Sandra Krause, and Ms. Kerry Aden.

This document is published by the Pacific Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award Number NA07FC0026.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADFG	Alaska Department of Fish and Game
BLM	U.S. Bureau of Land Management
BPA	Bonneville Power Administration
CARA	California Rivers Assessment
CCAP	Coastal Change Analysis Program
CDFFP	California Department of Forestry and Fire Protection
CDFG	California Deptartment of Fish and Game
CWT	coded-wire tag
DO	dissolved oxygen
EEZ	U.S. Exclusive Economic Zone (3-200 miles offshore)
EFH	essential fish habitat
ELMR	estuarine living marine resources
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarly significant units
FERC	Federal Energy Regulatory Commission
FMP	fishery management plan
FRI	Fisheries Research Institute
FSOS	For the Sake of the Salmon
GIS	Geographic Information System
IDFG	Idaho Department of Fish and Game
KRBFTF	Klamath River Basin Fisheries Task Force
NED	Northwest Environmental Database
NEP	National Estuary Program
NMFS	National Marine Fisheries Service
NMFS NWR	National Marine Fisheries Service - Northwest Regional Office
NMFS NWFSC	National Marine Fisheries Service - Northwest Fisheries Science Center
NMFS SWR	National Marine Fisheries Service - Southwest Regional Office
NOAA	National Oceanic and Atmospheric Administration
NOAA CSC	National Oceanic and Atmospheric Administration - Coastal Services Center
NOAA NOS	National Oceanic and Atmospheric Administration - National Ocean Service
NOAA ORCA	National Oceanic and Atmospheric Administration - Ocean Resources Conservation and Assessment Division
NPFMC	North Pacific Fishery Management Council
NPPC	Northwest Power Planning Council
NRC	National Research Council
NWIFC	Northwest Indian Fisheries Commission
OCSRI	Oregon Coastal Salmon Restoration Initiative
ODFW	Oregon Deptartment of Fish and Wildlife
ORIS	Oregon River Information System
OTSMS	Oregon Territorial Sea Management Study
OWRRI	Oregon Water Resources Research Institute
PFMC	Pacific Fishery Management Council
PSMFC	Pacific States Marine Fisheries Commission
PSWQAT	Puget Sound Water Quality Action Team
RAC	The Resources Agency of California
RACE	Resource Assessment and Conservation Engineering - NOAA/NMFS
SASSI	Salmon and Steelhead Stock Inventory
SSHIAP	Salmon and Steelhead Habitat Inventory and Assessment
USACOE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UW	University of Washington

WARIS	Washington Rivers Information System
WDF	Washington Department of Fisheries
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington Department of Ecology
WFWC	Washington Fish and Wildlife Commission
WWPI	Western Wood Preservers Institute
WWWSD	Western Washington Watershed Screening Database

INTRODUCTION

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for "Essential Fish Habitat" (EFH) descriptions in federal fishery management plans (FMPs) and to require federal agencies to consult with National Marine Fisheries Service (NMFS) on activities that may adversely affect EFH. The Magnuson-Stevens Act requires all fishery management councils to amend their FMPs to describe and identify EFH for each managed fishery.

The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH, and it does not distinguish between actions in EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside of EFH, such as upstream and upslope activities that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location.

Under section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. However, state agencies and private parties are not required to consult with NMFS unless state or private actions require a federal permit or receive federal funding.

While there is no formal requirement for state and private collaboration in the consultation process on adverse effects to salmon EFH, there is common interest in the reduction of threats to species listed under the Endangered Species Act, prevention of future listings, and productive and sustainable coastal fisheries in the context of the Magnuson-Stevens Act. Conservation of anadromous fish resources through voluntary coordination is a goal without geographical or jurisdictional boundaries.

This appendix has five chapters. Chapter 1 identifies EFH for the Pacific salmon fishery. U.S. Geological Survey (USGS) hydrologic units (Table A-1) are used as the descriptors for EFH and a coastwide map showing EFH also is included (Figure A-1). Chapter 2 describes the life history and habitat requirements for each of the three species managed under the FMP (chinook salmon, coho salmon, and Puget Sound pink salmon) and provides a general context for these Pacific salmon. Chapter 3 describes potential adverse effects to salmon EFH as well as conservation and enhancement measures to avoid or minimize these effects. Chapter 4 describes additional information and research needs for marine and estuarine distributions, life history, and cited in Appendix A.

1.0 IDENTIFICATION OF ESSENTIAL FISH HABITAT FOR THE PACIFIC SALMON FISHERY

"Essential fish habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

Magnuson-Stevens Act § 3

EFH for the Pacific coast salmon fishery means those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH must include all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception. Foreign waters off Canada, while still salmon habitat, are not included in salmon EFH, because they are outside United States jurisdiction. The Pacific coast salmon fishery EFH also includes the marine areas off Alaska designated as salmon EFH by the North Pacific Fishery Management Council (NPFMC). The geographic range of the salmon fishery EFH is shown in Figure A-1. This identification of EFH is based on the descriptions of habitat utilized by coho, chinook, and pink salmon provided in Chapter 2 of this appendix.

The geographic extent of freshwater EFH is specifically defined as all currently viable waters and most of the habitat historically accessible to salmon within the USGS hydrologic units identified in Table A-1. Salmon EFH excludes areas upstream of longstanding naturally impassible barriers (i.e., natural waterfalls in existence for several hundred years). Salmon EFH includes aquatic areas above all artificial barriers except the impassible barriers (dams) listed in Table A-2. However, activities occurring above impassable barriers that are likely to adversely affect EFH below impassable barriers are subject to the consultation provisions of the Magnuson-Stevens Act. In the future, should subsequent analyses determine the habitat above any of the dams listed in Table A-2 is necessary for salmon conservation, the Council will modify the identification of EFH.[1/]

1.1 COMPREHENSIVE APPROACH TO IDENTIFICATION

The Council chose a comprehensive rather than a limiting approach to the identification of salmon EFH for several reasons. In the marine environment, Pacific salmon distribution can only be defined generally throughout the exclusive economic zone (EEZ), because it is extensive, varies seasonally and interannually, and has not been extensively sampled in many ocean areas. In estuaries and freshwater, delimiting habitat to that which is essential is difficult, because of the diversity of habitats utilized by Pacific salmon coupled with (1) natural variability in habitat quality and use (e.g., some streams may have fish present only in years with plentiful rainfall; also, habitat of intermediate and low value may be important depending upon the health of the fish population and the ecosystem), (2) the current low abundance of Pacific salmon, and (3) lack of data on specific stream-by-stream historical distribution. Many of the current databases on salmon distribution were developed during recent periods of low salmon abundance and may not accurately reflect the complete distribution and habitats utilized by salmon. Furthermore, the current information on salmon freshwater distribution is useful at the regional level for determining which watersheds salmon inhabit, but not necessarily for identifying EFH down to specific stream reaches and habitats utilized by salmon.

Adopting an inclusive, watershed-based description of EFH using USGS hydrologic units is appropriate, because it (1) recognizes the species' use of diverse habitats and underscores the need to account for all of the habitat types supporting the species' freshwater and estuarine life stages, from small headwater streams to migration corridors and estuarine rearing areas; (2) considers the variability of freshwater habitat as affected

1/ Table A-6 (Chapter 2) provides documentation for the current and historic distribution, including areas above dams. Table A-1 is a subset of Table A-6.

by environmental conditions (droughts, floods, etc.) that make precise mapping difficult; and (3) reinforces important linkages between aquatic and adjacent upslope areas. Habitat available and utilized by salmon changes frequently in response to floods, landslides, woody debris inputs, sediment delivery, and other natural events. To expect the distribution of salmon within a stream, watershed, province, or region to remain static over time is unrealistic. Furthermore, this watershed-based approach is consistent with other Pacific salmon habitat conservation and recovery efforts such as those implemented under the Endangered Species Act (ESA). Additional details on Pacific salmon freshwater essential habitat is provided in Chapter 2 of this appendix.

As new and better information becomes available, the Council will consider potential modifications to the identification and description of EFH during the process of scoping changes to the FMP.

1.2 CONSIDERATION OF ARTIFICIAL BARRIERS

In identifying EFH, the Council considered artificial barriers (dams) that affect salmon habitat. Numerous hydropower, water storage, and flood control projects have been built that either block access to areas used historically by salmonids or alter the hydrography of downstream river reaches. While available information is not sufficient to conclude that currently accessible habitat is sufficient for supporting sustainable salmon fisheries and a healthy ecosystem, subsequent analyses (e.g., in recovery planning, ESA consultations, or hydropower proceedings) may conclude that currently inaccessible habitat should be made available to the species. The Council, therefore, considered whether more than 50 large dams in Washington, Idaho, Oregon, and California should be designated as the upstream extent of EFH. The four criteria used to evaluate EFH and the dams were:

1. *Is the dam federally owned or operated, licensed by the Federal Energy Regulatory Commission (FERC), state licensed, or subject to state dam safety supervision?* This criterion assures the dam is of sufficient size, permanence, impassibility, and legal identity to warrant consideration for inclusion in this list.

2. *Is the dam upstream of any other impassable dam*? This criterion provides for a continuous boundary of designated habitat.

3. *Is fish passage to upstream areas under consideration, or are fish passage facilities in the design or construction phase*? There is no currently, or soon to be, accessible freshwater salmon habitat that is expendable. All such habitat is key to the conservation of these species and needs the special considerations for protection and restoration incumbent with designation.

4. *Has NMFS determined the dam does not block access to habitat that is key for the conservation of the species?* This criterion provides for designation of habitat upstream of, and exclusion of, otherwise listed dams when NMFS is able to determine restoration of passage and conservation of such habitat is necessary for long-term survival of the species and sustainability of the fishery.

Based on these considerations, the Council excluded certain dams from the list of those representing the upstream extent of EFH including Elwha Dam, Merwin Dam, Landsburg Dam, Howard Hanson Dam, Condit Dam, Cushman Dam, Mayfield Dam, Foster Dam, Pelton Dam, and Englebright Dam. Several large, impassable dams, (e.g., Grand Coulee and Shasta dams), were removed from the list, since they are above other impassible dams. Subsequent analyses may indicate other dams should be removed from Table A-2.

Throughout the range of Pacific salmon, numerous hydropower dams are undergoing or are scheduled for relicensing by FERC. Information developed during the process of relicensing requires evaluation to determine whether fish passage facilities will be required at such dams to restore access to historically accessible habitat. Even though habitat above such barriers may not currently be designated as EFH, this conclusion does not diminish the potential importance of restoring access to these areas. Therefore, a determination on a case-by-case basis during FERC relicensing proceedings whether fish passage facilities will be required to provide access to habitat above currently impassible barriers will be necessary. Should salmon access or reintroduction above any of the dams listed in Table A-2 become feasible, the Council will remove them from the list, and the areas above the barriers would be designated as salmon EFH.

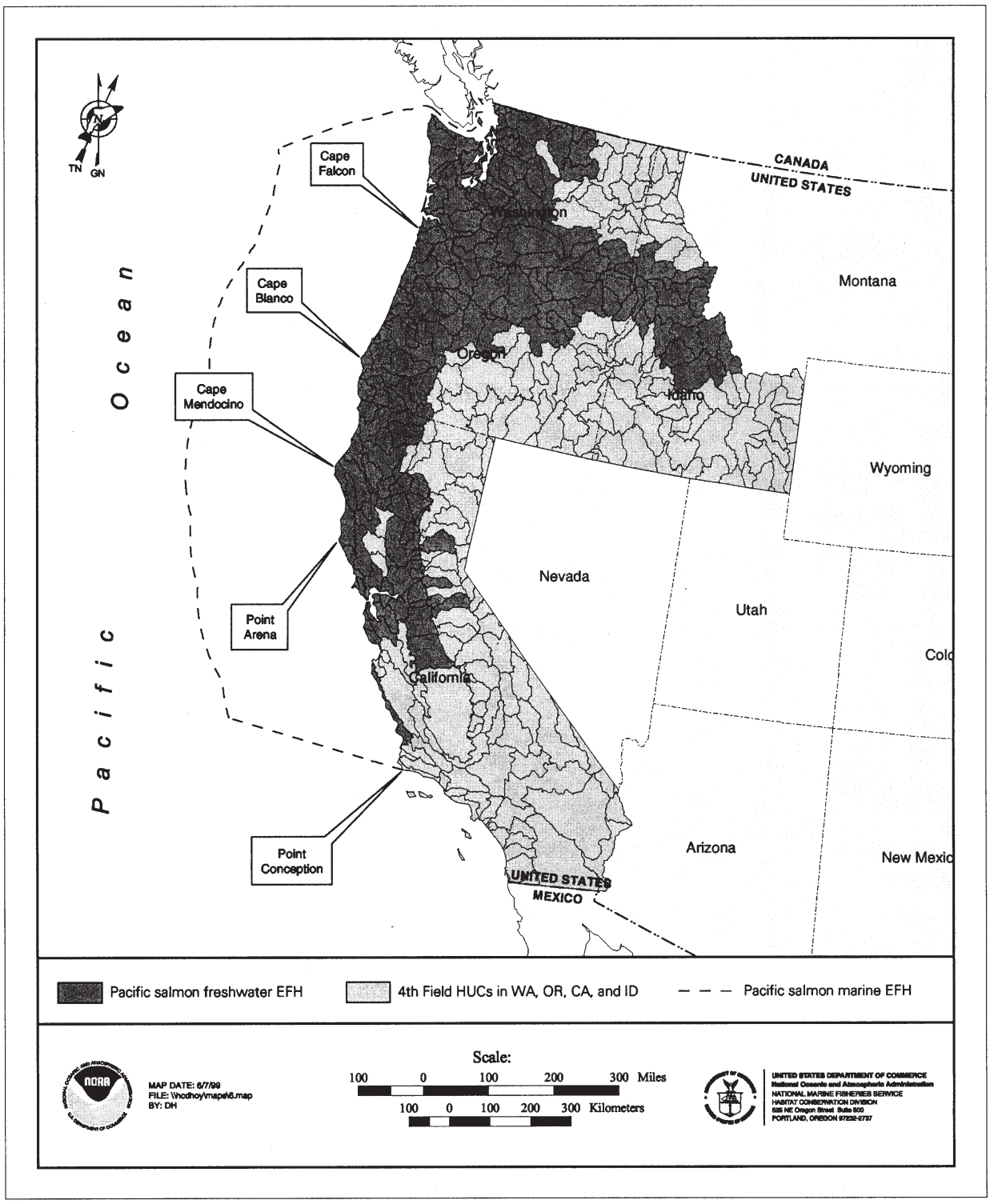

FIGURE A-1. Pacific salmon freshwater and marine EFH. Freshwater EFH includes currently viable aquatic habitat and most of the habitat historically accessible to Pacific salmon within the shaded hydrologic units (watersheds).

TABLE A-1. Pacific salmon freshwater EFH identified by USGS hydrologic unit number. (Page 1 of 5)

USGS Hydr. Unit	State(s)	Hydrologic Unit Name	Salmon Species
17110001	WA	Fraser (Whatcom)	coho salmon
17110002	WA	Strait of Georgia	chinook and coho salmon Puget Sound pink salmon
17110003	WA	San Juan Islands	chinook and coho salmon
17110004	WA	Nooksack River	chinook and coho salmon Puget Sound pink salmon
17110005	WA	Upper Skagit	chinook and coho salmon Puget Sound pink salmon Puget Sound sockeye salmon
17110006	WA	Sauk River	chinook and coho salmon Puget Sound pink salmon
17110007	WA	Lower Skagit River	chinook and coho salmon Puget Sound pink salmon Puget Sound sockeye salmon
17110008	WA	Stillaguamish River	chinook and coho salmon Puget Sound pink salmon
17110009	WA	Skykomish River	chinook and coho salmon Puget Sound pink salmon
17110010	WA	Snoqualmie River	chinook and coho salmon Puget Sound pink salmon
17110011	WA	Snohomish River	chinook and coho salmon Puget Sound pink salmon
17110012	WA	Lake Washington	chinook and coho salmon Puget Sound sockeye salmon
17110013	WA	Duwamish River	chinook and coho salmon
17110014	WA	Puyallup River	chinook and coho salmon Puget Sound pink salmon
17110015	WA	Nisqually River	chinook and coho salmon Puget Sound pink salmon
17110016	WA	Deschutes River	chinook and coho salmon
17110017	WA	Skokomish River	chinook and coho salmon
17110018	WA	Hood Canal	chinook and coho salmon Puget Sound pink salmon
17110019	WA	Puget Sound	chinook and coho salmon
17110020	WA	Dungeness - Elwha	chinook and coho salmon Puget Sound pink salmon
17110021	WA	Hoko - Crescent	chinook and coho salmon
17100101	WA	Hoh - Quillayute	chinook and coho salmon
17100102	WA	Queets - Quinault	chinook and coho salmon
17100103	WA	Upper Chehalis River	chinook and coho salmon
17100104	WA	Lower Chehalis River	chinook and coho salmon
17100105	WA	Grays Harbor	chinook and coho salmon
17100106	WA	Willapa Bay	chinook and coho salmon
17080001	OR/WA	Lower Columbia-Sandy River	chinook and coho salmon
17080002	WA	Lewis River	chinook and coho salmon
17080003	OR/WA	Lower Columbia - Clatskanie River	chinook and coho salmon
17080004	WA	Upper Cowlitz River	chinook and coho salmon
17080005	WA	Lower Cowlitz River	chinook and coho salmon

TABLE A-1. Pacific salmon freshwater EFH identified by USGS hydrologic unit number. (Page 2 of 5)

USGS Hydr. Unit	State(s)	Hydrologic Unit Name	Salmon Species
17080006	OR/WA	Lower Columbia	chinook and coho salmon
17090001	OR	Middle Fork Willamette River	chinook salmon
17090002	OR	Coast Fork Willamette River	chinook salmon
17090003	OR	Upper Willamette River	chinook and coho salmon
17090004	OR	McKenzie River	chinook and coho salmon
17090005	OR	N. Santiam River	chinook and coho salmon
17090006	OR	S. Santiam River	chinook and coho salmon
17090007	OR	Mid. Willamette River	chinook and coho salmon
17090008	OR	Yamhill River	chinook and coho salmon
17090009	OR	Molalla - Pudding River	chinook and coho salmon
17090010	OR	Tualatin River	chinook and coho salmon
17090011	OR	Clackamas River	chinook and coho salmon
17090012	OR	Lower Willamette River	chinook and coho salmon
17070101	OR/WA	Mid. Columbia - Lake Wallula	chinook salmon
17070102	OR/WA	Walla Walla River	chinook salmon
17070103	OR	Umatilla River	chinook salmon
17071004	OR	Willow	chinook salmon
17070105	OR/WA	Mid. Columbia - Hood	chinook and coho salmon
17070106	WA	Klickitat River	chinook salmon
17070301	OR	Upper Deschutes River	chinook salmon
17070305	OR	Lower Crooked River	chinook salmon
17070306	OR	Lower Deschutes River	chinook and coho salmon
17070307	OR	Trout Creek	chinook and coho salmon
17070201	OR	Upper John Day River	chinook salmon
17070202	OR	North Fork John Day River	chinook salmon
17070203	OR	Middle Fork John Day River	chinook salmon
17070204	OR	Lower John Day River	chinook salmon
17030001	WA	Upper Yakima River	chinook and coho salmon
17030002	WA	Naches River	chinook and coho salmon
17030003	WA	Lower Yakima River	chinook and coho salmon
17020005	WA	Chief Joseph River	chinook and coho salmon
17020006	WA/BC	Okanogan River	chinook salmon
17020007	WA/BC	Similkameen	chinook salmon
17020008	WA	Methow River	chinook and coho salmon
17020010	WA	Upper Columbia - Entiat River	chinook and coho salmon
17020011	WA	Wenatchee River	chinook and coho salmon
17020016	WA	Upper Columbia - Priest Rapids	chinook salmon
17060101	OR/ID	Hells Canyon	chinook salmon
17060102	OR	Imnaha River	chinook salmon
17060103	OR/WA/ID	Lower Snake - Asotin Creek	chinook and coho salmon
17060104	OR	Upper Grande Ronde	chinook and coho salmon

TABLE A-1. Pacific salmon freshwater EFH identified by USGS hydrologic unit number. (Page 3 of 5)

USGS Hydr. Unit	State(s)	Hydrologic Unit Name	Salmon Species
17060105	OR	Wallowa River	chinook and coho salmon
17060106	OR/WA	Lower Grande Ronde	chinook and coho salmon
17060107	WA	Lower Snake - Tucannon River	chinook and coho salmon
17060110	WA	Lower Snake River	chinook salmon
17060201	ID	Upper Salmon River	chinook salmon
17060202	ID	Pahsimeroi River	chinook salmon
17060203	ID	Mid. Salmon - Panther River	chinook salmon
17060204	ID	Lemhi River	chinook salmon
17060205	ID	Upper Middle Fork Salmon River	chinook salmon
17060206	ID	Lower Middle Fork Salmon River	chinook salmon
17060207	ID	Mid. Salmon - Chamberlain	chinook salmon
17060208	ID	S.F. Salmon River	chinook salmon
17060209	ID	Lower Salmon River	chinook salmon
17060210	ID	Little Salmon River	chinook salmon
17060301	ID	Upper Selway River	chinook salmon
17060302	ID	Lower Selway River	chinook salmon
17060303	ID	Lochsa River	chinook salmon
17060304	ID	M.F. Clearwater River	chinook salmon
17060305	ID	S.F. Clearwater River	chinook salmon
17060306	WA/ID	Clearwater River	chinook and coho salmon
17100201	OR	Necanicum River	chinook and coho salmon
17100202	OR	Nehalem River	chinook and coho salmon
17100203	OR	Wilson - Trask - Nestucca	chinook and coho salmon
17100204	OR	Siletz-Yaquina River	chinook and coho salmon
17100205	OR	Alsea River	chinook and coho salmon
17100206	OR	Siuslaw River	chinook and coho salmon
17100207	OR	Siltcoos River	chinook and coho salmon
17100301	OR	N. Umpqua River	chinook and coho salmon
17100302	OR	S. Umpqua River	chinook and coho salmon
17100303	OR	Umpqua River	chinook and coho salmon
17100304	OR	Coos River	chinook and coho salmon
17100305	OR	Coquille River	chinook and coho salmon
17100306	OR	Sixes River	chinook and coho salmon
17100307	OR	Upper Rogue River	chinook and coho salmon
17100308	OR	Middle Rogue River	chinook and coho salmon
17100309	CA/OR	Applegate River	chinook and coho salmon
17100310	OR	Lower Rogue River	chinook and coho salmon
17100311	CA/OR	Illinois River	chinook and coho salmon
17100312	CA/OR	Chetco River	chinook and coho salmon
18010101	CA/OR	Smith River	chinook and coho salmon
18010206	CA/OR	Upper Klamath River	chinook and coho salmon

TABLE A-1. Pacific salmon freshwater EFH identified by USGS hydrologic unit number. (Page 4 of 5)

USGS Hydr. Unit	State(s)	Hydrologic Unit Name	Salmon Species
18010207	CA	Shasta River	chinook and coho salmon
18010208	CA	Scott River	chinook and coho salmon
18010209	CA/OR	Lower Klamath River	chinook and coho salmon
18010210	CA	Salmon River	chinook and coho salmon
18010211	CA	Trinity River	chinook and coho salmon
18010212	CA	S.F. Trinity River	chinook and coho salmon
18010102	CA	Mad-Redwood	chinook and coho salmon
18010103	CA	Upper Eel River	chinook and coho salmon
18010104	CA	Middle Fork Eel River	chinook and coho salmon
18010105	CA	Lower Eel River	chinook and coho salmon
18010106	CA	South Fork Eel River	chinook and coho salmon
18010107	CA	Mattole River	chinook and coho salmon
18010108	CA	Big - Navarro - Garcia	chinook and coho salmon
18010109	CA	Gualala - Salmon Creek	chinook and coho salmon
18010110	CA	Russian River	chinook and coho salmon
18010111	CA	Bodega Bay	chinook and coho salmon
18060001	CA	San Lorenzo-Soquel	coho salmon
18060006	CA	Central Coastal	coho salmon
18050001	CA	Suisun Bay	chinook
18050002	CA	San Pablo Bay	chinook
18050003	CA	Coyote Creek	chinook
18050004	CA	San Francisco Bay	chinook and coho salmon
18050005	CA	Tomales-Drakes Bay	coho salmon
18050006	CA	San Francisco-Coastal South	coho salmon
18020101	CA	Sac.-Lower Cow-Lower Clear	chinook salmon
18020102	CA	Lower Cottonwood Creek	chinook salmon
18020103	CA	Sacramento - Lower Thomes	chinook salmon
18020104	CA	Sacramento - Stone Corral	chinook salmon
18020105	CA	Lower Butte Creek	chinook salmon
18020106	CA	Lower Feather River	chinook salmon
18020107	CA	Lower Yuba River	chinook salmon
18020108	CA	Lower Bear River	chinook salmon
18020109	CA	Lower Sacramento River	chinook salmon
18020110	CA	Lower Cache	chinook salmon
18020111	CA	Lower American River	chinook salmon
18020112	CA	Sacramento-Upper Clear	chinook salmon
18020113	CA	Cottonwood Headwaters	chinook salmon
18020114	CA	Elder Creek	chinook salmon
18020118	CA	Upper Cow - Battle Creek	chinook salmon
18020119	CA	Mill - Big Chico	chinook salmon
18020120	CA	Upper Butte Creek	chinook salmon

TABLE A-1. Pacific salmon freshwater EFH identified by USGS hydrologic unit number. (Page 5 of 5)

USGS Hydr. Unit	State(s)	Hydrologic Unit Name	Salmon Species
18020125	CA	Upper Yuba	chinook salmon
18040001	CA	Mid. San Joaquin- L. Cowchilla	chinook salmon
18040002	CA	Mid. San Joaquin- L. Merced- L. Stanislaus	chinook salmon
18040003	CA	San Joaquin Delta	chinook salmon
18040004	CA	L. Calaveras - Mormon Slough	chinook salmon
18040005	CA	L. Consumnes- L. Mokelumne	chinook salmon
18040010	CA	Upper Stanislaus	chinook salmon
18040011	CA	Upper Calveras	chinook salmon
18040013	CA	Upper Cosumnes	chinook salmon

TABLE A-2. List of man-made barriers (dams) that represent the upstream extent of Pacific salmon EFH. (Page 1 of 2)

Name of Barrier	State	USGS Hydrologic Unit	Tributary/Basin
Gorge Lake Dam	WA	17110005	Skagit River
Cedar Falls Dam	WA	17110012	Cedar River
Tolt Dam	WA	17110010	Snoqualmie River
Keechelus Dam	WA	17030001	Yakima River
Kachess Dam	WA	17030001	Yakima River
Cle Elum Dam	WA	17030001	Yakima River, Cle Elum River
Rimrock Dam	WA	17030002	Naches River
Chief Joseph Dam	WA	17020005	Upper Columbia River
Dworshak Dam	ID	17060308	Clearwater River
Hells Canyon Complex (Hells Canyon, Oxbow, and Brownlee Dams)	ID	17050201	Snake River
Opel Springs Dam	OR	17070306	Deschutes River
Big Cliff Dam	OR	17090005	N. Santiam River
Cougar Dam	OR	17090004	McKenzie River
Dexter Dam	OR	17090001	Middle Fork Willamette River
Dorena Dam	OR	17090002	Coast Fork Willamette River
Soda Springs Dam	OR	17100301	N. Umpqua River
Lost Creek Dam	OR	17100307	Rogue River
Applegate Dam	OR	17100309	Applegate River
Bull Run Dam	OR	17080001	Bull Run River/Sandy River
Oak Grove Dam	OR	17090011	Clackamas River
Iron Gate Dam	CA	18010206	Klamath River
Lewiston Dam	CA	18010211	Trinity River
Dwinnell Dam or Shasta River Dam	CA	18010207	Shasta
Robert W. Matthews Dam	CA	18010102	Mad River
Coyote Valley Dam	CA	18010110	E. Fork Russian River
Warm Springs Dam	CA	18010110	Dry Creek
Scott Dam	CA	18010103	Eel River
Keswick Dam	CA	18020112	Sacramento River
Oroville Dam	CA	18020121 & 18020123	Feather River
Black Butte Dam	CA	18020115	Stoney Creek
Whiskeytown Dam	CA	18020112	Clear Creek
Camp Far West Dam	CA	18020126	Bear River
Nimbus Dam	CA	18020111	American River
Friant Dam	CA	18040006	San Joaquin River
Camanche Dam	CA	18040005	Mokelumne River

TABLE A-2. List of man-made barriers (dams) that represent the upstream extent of Pacific salmon EFH. (Page 2 of 2)

Name of Barrier	State	USGS Hydrologic Unit	Tributary/Basin
New Hogan Dam	CA	18040011	Calaveras River
Crocker Diversion Dam	CA	18040008	Merced River
Goodwin Dam	CA	18040010	Stanislaus River
La Grange Dam	CA	18040002	Tuolumne River
Nicasio Dam	CA	18050005	Nicasio Creek
Peters Dam	CA	18050005	Lagunitas Creek
San Pablo Dam	CA	18050002	San Pablo Bay
LeRoy Anderson Dam	CA	18050003	Coyote Creek
Newell Dam	CA	18060001	Newell Creek