Northwest Forest Plan Aquatic Conservation Strategy

The Implementation of the Northwest Forest Plan Aquatic Conservation Strategy on BLM and FS-administered lands within the Oregon Coastal Coho ESU

Submitted by

Oregon State Bureau of Land Management
and
Region 6 United States Forest Service

Submitted to

State of Oregon
Oregon Plan for Salmon and Watersheds Assessment Team

The Bureau of Land Management and United States Forest Service

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Acknowledgements

The BLM and FS would like to thank the Oregon Department of Fish and Wildlife (ODFW) Research Lab in Corvallis, Oregon. The ODFW office provided much of the information used to create several tables in this report. Additional appreciation is extended to the Forest Service Pacific Northwest Research Station (Forestry Sciences Laboratory), located in Corvallis, Oregon. Through the use of a debris-flow model, the laboratory helped demonstrate the role of federal-lands in contributing large woody debris to streams in the Oregon Coastal coho ESU.

I. Introduction

To more aggressively address dwindling salmon, trout, and other fish stocks, the Bureau of land Management (BLM) and Forest Service (FS) amended their Land and Resource Management Plans in California, Idaho, Oregon, Utah, and Washington in the early 1990's to better protect fish habitat and restore water quality. These amendments are commonly known as the Northwest Forest Plan (NWFP) (USDA and USDI 1994), INFISH (USDA and USDI 1995a), and PACFISH (USDA and USDI 1995b).

The NWFP, which will be the focus of this report, covers the BLM and FS-administered lands within the range of the Northern Spotted Owl. The Aquatic Conservation Strategy (ACS) is an integral part of the NWFP and was developed to maintain and restore the ecological health of watersheds and aquatic ecosystems on public lands through implementation of four components: 1) riparian reserves 2) key watersheds 3) watershed analysis 4) watershed restoration. The ACS provides a common approach for managing lands administered by the BLM and FS, including those within the Oregon Coastal coho Evolutionary Significant Unit, hereafter referred to as the Oregon Coastal coho ESU.

In a complimentary manner, the state of Oregon chartered the Oregon Coastal Salmon Restoration Initiative (OCSRI) in 1997 to restore coastal salmon populations and fisheries to productive and sustainable levels. The OCSRI used a three pronged approach in its recovery efforts: 1) relying on and enforcing existing legislation 2) building partnerships with federal and other agencies and entities 3) supporting voluntary restoration efforts through watershed councils and other groups. In 1998, the state broadened its fish recovery efforts to include steelhead runs in coastal basins, the Lower Columbia and Snake Rivers, Klamath Mountain regions and the Upper Willamette River Basin, transforming the OCSRI to the Oregon Plan for Salmon and Watersheds (OP). Finally, in 1999 Governor Kitzhaber expanded the OP efforts to all at-risk salmonids, through Executive Order 99-01, across the state and reemphasized that recovery efforts will rely heavily on cooperative efforts among state, local, federal, tribal and private organizations.

From the start, the BLM and FS have been strong supporters and active participants in the OP, striving to integrate the ACS and OP aquatic programs. In letter dated May 30, 1997 Governor Kitzhaber recognized the BLM and FS for their assistance in completing the OCSRI as well as committing to Federal Measures for each agency to implement. As time progressed, the BLM and FS committed staff to attend OP committees and Implementation, Monitoring, and Outreach teams. This report, as requested in an Oregon Watershed Enhancement Board (OWEB) letter dated October 1, 2004, exemplifies a continued effort of the BLM and FS to integrate the ACS and OP initiatives. It is the goal of this report to describe the application of the four ACS components—riparian reserves, key watersheds, watershed analysis, watershed restoration—on BLM and FS-administered lands within the Oregon Coastal coho ESU. In doing so, this report will describe the ways in which the ACS addresses Oregon Department of Fish and Wildlife Factors for Decline, Independent Multidisciplinary Science Team (IMST) reports, and NOAA Fisheries comments to the draft BLM/FS report submitted to the State of Oregon on December 17, 2004. This document, however, will not include a critical assessment of ACS effects on Oregon Coastal coho as the State of Oregon will determine the combined and relative effects of various management activities—private, state, and federal—on the recovery of this fish.

II. Objective

Describe the ways in which the NWFP Aquatic Conservation Strategy (ACS) and its four components—riparian reserves, key watersheds, watershed analysis, watershed restoration—have been applied to the BLM and FS-administered lands within the Oregon Coastal coho ESU

III. Implementation of the Northwest Forest Plan ACS on BLM and FS-administered lands within the Oregon Coastal coho ESU

This portion of the report will be comprised of five sections, all of which are based on ACS elements: 1) objectives 2) riparian reserves 3) key watersheds 4) watershed analysis 5) watershed restoration. Each section will contain a description of the ACS element, its application within the Oregon Coastal coho ESU, and the ways it addresses ODFW Factors for Decline and IMST reports. In the appropriate places, the report will address comments provided by NOAA Fisheries on the BLM/FS draft report submitted to the State of Oregon on December 17, 2004. Finally, this report includes the BLM and FS response to the ways in which the ACS addresses PECE Policy questions, which can be located in Appendix 1.

A. ACS Objectives

1. Description

The ACS objectives are designed to guide management on all BLM and FS-administered lands within the NWFP area as to maintain and restore ecosystem health at watershed and landscape scales to protect fish habitat and other riparian resources. The objectives include the following:

i. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

ii. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

iii. Maintain and restore physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

iv. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

v. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

vi. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

vii. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

viii. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to support amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

ix. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

2. Implementation within the Oregon Coastal coho ESU

All BLM and FS management activities must comply with ACS Objectives. Therefore, prior to implementing a project, a BLM or FS decision maker must conclude that the project will "meet," "not adversely affect," "not retard attainment of," or otherwise achieve attainment of ACS objectives (USDA and USDI 2004). It should be noted that short-term degradation is permissible as part of the process to attain ACS objectives. For example, replacing a culvert to restore fish passage will result in a short-term rise in stream turbidity but helps attain ACS Objectives, specifically objectives #2 and #9. It is such trade-offs, short-term adverse affects for long-term benefits, that are expected and permissible under the ACS.

3. ODFW Factors for Decline

The ACS Objectives focus BLM and FS management in a manner that addresses many of the ODFW Factors for Decline, especially those elements found under the Physical Habitat, Water Quality, Water Quantity, and Biological Condition categories. Refer to Appendix 2 – ODFW Factors of Decline for a complete list of these limiting factors to Oregon Coastal coho. For instance, objective #1, which directs management actions to "Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted" is all encompassing in that it logically results in most elements within the four categories being addressed. Other ACS objectives are more specific and can be directly linked to ODFW Factors for Decline within the Physical Habitat, Water Quality, and Water Quantity categories. For example, objectives 3, 5, and 8 promote maintenance and restoration of channel morphology, natural sediment regimes, and riparian and in-stream habitat features, respectively. Further, objectives 4, 6, 7 emphasize water quality, in-stream flows, and timing and duration of flood events, respectively. Finally, objective 2 emphasizes uninterrupted riparian and stream channel connections within and among watersheds, while objective 10 promotes well distributed populations, both of which promote or relate to fish passage issues.

In of themselves, the ACS Objectives do not specifically address the ODFW Factors for Decline but guide the BLM and FS to move in that direction. It is the actual management actions that directly address the factors for decline, and many such actions are implemented through the four ACS components—riparian reserves, key watersheds, watershed assessment, and watershed restoration.

4. IMST Conclusions and Recommendations

In the report entitled Recovery of Wild Salmonids in Western Oregon Forests: Oregon Forest Practices Act Rules and the Measures in the Oregon Plan for Salmon and Watersheds. Technical Report 1999-1, the IMST makes several conclusions and recommendations for management of western Oregon Forests, primarily on state and private lands. In regards to native salmonids, the IMST states "we conclude that the goal of management and policy should emulate (not duplicate) natural processes within their historic range." Within "Recommendation 2," the IMST refines this statement and suggests that "Goals that ensure the integrity of salmonid habitat should be identified for the characteristics of aquatic systems and riparian upslope forest across the landscape." The ACS Objectives put forth such goals and guide BLM and FS actions in a manner that addresses landscape processes, including those related to stream channels, riparian zones, and upslope areas.

B. ACS Riparian Reserves

1. Description

Riparian areas include those places in the watershed directly coupled to streams and rivers, the areas required for maintaining hydrologic, geomorphic, and ecological processes that directly affect standing and flowing water bodies such as lakes, ponds, wetlands, streams, stream processes and fish habitats (USDA and USDI 1994). Riparian habitats help maintain

the integrity of the aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams (2) providing root strength for channel stability (3) shading the stream, and (4) protecting water quality (USDA and USDI 1995a). To protect riparian areas and associated functions on BLM and FS-administered lands, the Northwest Forest Plan ACS mandated the establishment of riparian buffers along streams. Further, the ACS included standards and guides that prohibit and regulate management activities that retard or prevent attainment of ACS objectives. Under the ACS, these riparian buffers are referred to as Riparian Reserves, and their width along a stream or water body depends whether a stream is fish bearing; permanently flowing and non-fish bearing; or intermittent:

i. Fish-bearing streams – riparian reserves consist of the stream and area on each side of the stream extending from the edges of the active stream channel to top of the inner gorge, or the outer edges of the 100-year floodplain, of the outer edges of the riparian vegetation, or the a distance equally to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

ii. Permanently flowing non fish-bearing streams – riparian reserves consist of the stream and area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or the outer edges of the 100-year floodplain, of the outer edges of the riparian vegetation, or the a distance equally to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.

iii. Lakes and natural ponds – riparian reserves consists of the body of water and the area to the outer edges of the riparian vegetation, or to the extent of seasonable saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.

iv. Seasonally flowing or intermittent streams – riparian reserves extend from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet, whichever is greatest.

To ensure that management of Riparian Reserves meet ACS objectives, standards and guides have been created to guide management activities in these stream-side zones. The standards and guides direct timber, road, grazing, recreation, minerals, fire and fuels and other management activities in such a manner as to help meet ACS objectives within Riparian Reserves. For instance, standard and guide "TM-1." prohibits timber harvest, including fuel-wood cutting, in Riparian Reserves when such actions do not meet ACS objectives. Refer to Appendix 3 – Standards and Guidelines as Applied to ACS Riparian Reserves.

2. Implementation within Oregon Coastal coho ESU

There are 6,575 miles of coho-bearing streams in the Oregon Coastal coho ESU, of which 1,342 miles (20%) flow through BLM and FS-administered lands. In addition, there are 131 miles of stream on BLM and FS-administered lands identified as having High Intrinsic Potential (HIP) for coho, approximating 10% of the HIP streams in the ESU. In general, the HIP coho streams are those that flow through unconstrained valleys, have gradients below

7%, and are used as over-wintering habitat by juvenile coho (Burnett et al 2005). Refer to Table 1 – Riparian Reserves on BLM and FS-administered Lands within the Oregon Coastal coho ESU.

The relative percentage of HIP streams on BLM and FS-administered lands actually available to coho maybe greater than 10%. The total number of stream miles identified as having HIP includes all streams that currently provide, have the potential to provide, or once had the potential to provide quality over-winter habitat for juvenile coho. For instance, a percentage of HIP streams may never serve as over-wintering habitat into the foreseeable because they have been significantly altered through urban or rural development. Additional HIP streams have the potential to provide quality habitat but are not or will not be managed to do so in the foreseeable future. Therefore, the actual number of HIP stream miles offering quality habitat to coho is likely smaller than the 1,342 miles shown in Table 1. The great majority (if not all) HIP stream miles on BLM and FS-administered lands are in a condition that offers suitable over-wintering habitat or are being managed under the ACS to promote such habitat. Therefore, the relative quantity of HIP streams on BLM and FS lands is probably greater than the 10% figure would suggest. Depending on the current and future condition of non-federal HIP streams, the degree of importance of ACS administered streams to Oregon Coastal coho recovery will vary. The BLM and FS suggest that this issue be addressed further in the final report completed by the State Assessment Team and NOAA Fisheries.

Table 1 - Riparian Reserves on BLM and FS-administered Lands within the Oregon Coastal coho ESU*

Monitoring Areas and Population Units	All Land Ownerships		BLM and Forest Service-administered ACS Riparian Reserves		
	Coho-bearing streams (total miles)	Coho-bearing streams (HIP miles**)	Coho-bearing streams (total miles)	Coho-bearing streams (HIP miles)	Non-Coho streams (total miles)
North Coast					
Ecola	12.4	1.9	-***	-	-
Necanicum	71.4	18.0	-	-	-
Nehalem	665	147	3.7	0.4	30.7
Neskowin	20.7	4.8	7.2	0.8	88.1
Nestucca	204	28.5	78.5	2.5	1,135
Netarts	18.3	4.2	3.4	0.4	56.2
Rockaway	1.0	0.4	0.0	0.0	0.0
Tillamook	365	56.7	11.1	0.3	185
Mid-Coast					
Alsea	378	73.5	170	16.1	1,248
Beaver	36.3	10.2	10.1	0.6	94.0
Depoe Bay	31.8	6.9	-	-	-
Devils Lake	11.8	3.5	2.1	0.0	13.3
Salmon	55.4	7.1	10.5	1.0	112
Seal Rock	0.6	0.1	0.0	0.0	0.0

Siletz	251	42.5	22.6	0.2	329
Siuslaw	759	200	260	37.8	1,741
Thiel Creek	5.6	1.3	0.1	0.0	0.8
Yachats	139	20.5	75.6	4.0	708
Yaquina	246	69.6	16.8	0.9	141
Umpqua					
Lower Umpqua	535	103	201	31.6	1,755
Upper Umpqua	1,443	221	307	17.9	10,873
Mid-South Coast					
Cape Arago	8.0	1.8	-	-	-
Carter lake	-	-	-	-	-
China Creek	18.9	7.2	-	-	-
Coos	412	79.2	30.5	1.9	325
Coquille	541	118	93.7	8.0	1,994
Floras	71.3	25.8	2.7	1.9	29.6
Siltcoos	87.7	27.9	14.7	2.8	168
Sixes	60.7	6.8	10.2	0.1	242
Tahkenitch	48.3	12.1	6.0	1.1	40.1
Tenmile	78.6	21.9	3.0	1.0	3.9
Threemile Creek	0.2	0.0	-	-	-
Total	**6,575**	**1,321**	**1,342**	**131**	**21,312**

* Data for this table was provided by ODFW Corvallis Research Lab, using the CLAMS database at 1:1,000 k stream layer ** HIP – High Intrinsic Potential habitat for coho *** The dash mark (-) indicates no BLM and/or FS-administered lands within the population unit.

3. ODFW Factors for Decline

Riparian Reserves help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams (2) providing root strength for channel stability (3) shading the stream, and (4) protecting water quality. Therefore, Riparian Reserves will directly address several ODFW Factors for Decline, mainly those found under the physical habitat and water quality categories. Refer to Table 2 - ACS Riparian Reserves and ODFW Factors for Decline. With this in mind, 20% (1,342 miles) of all coho-bearing streams and 10% (131 miles) of all HIP streams are currently afforded protection (passive restoration) under the Riparian Reserve network.

Furthermore, there are 21,312 miles of non coho-bearing streams on BLM and FS-administered lands that can contribute course woody debris to coho-bearing streams. Many of these streams are fish-bearing and are well suited for steelhead and other native resident fish species. Further, all of these streams, which are managed under the ACS, occur throughout the Oregon Coastal coho ESU, most of which occur in the Umpqua monitoring area, followed by the Mid Coast, Mid-South Coast, then North Coast monitoring areas. Even though these streams may not offer habitat to coho, they can provide large woody debris to such habitat. For instance, Miller and Burnett (2005 unpublished) created a debris-flow model, which identifies streams with a high probability of capturing and transporting large wood from nearby uplands, which are susceptible to landslides during storm/flood events. The model was tailored to predict debris flows within the Oregon Coast Range. Not only does the model consider vegetation, geology, and gradient in making predictions, it accounts for land ownerships and associated policies that affect large wood availability in riparian and upland areas.

The Forest Service Pacific Northwest Research Station (Forestry Sciences Laboratories) applied the model to the Smith River watershed, located in the Umpqua River basin, to describe the potential contributions of large wood to streams from various land ownerships. The results show that 85% of all large wood (>50cm dbh) from debris flows—having direct connections to coho-bearing streams—will originate on BLM and FS administered lands. Because 55% of the debris-flow prone areas are under BLM and FS ownership, the model demonstrates that the ACS Riparian Reserves would produce disproportionately more large wood (compared to other land ownerships) during storm events for recruitment into ESU streams. The remaining 45% of the debris-flow prone areas are under the following ownership patterns: private industrial (39%), private non industrial (5%), state and others (1%). Because State and BLM/FS forest practices are consistent across the Oregon Coastal coho ESU, a general conclusion can be made that the BLM and FS Riparian Reserves will contribute disproportionately more large wood to streams than most other land owners throughout the ESU. These results are consistent with conclusions in the May 6, 1997 edition of the Federal Register, whereby NOAA Fisheries suggested that large wood recruitment from non-federal lands will be low relative to recruitment from federal lands. (Refer to Miller and Burnett in reference section for additional contact information.)

Table 2 – ACS Riparian Reserves and ODFW Factors for Decline

Riparian Reserve Designations	ODFW Factor for Decline Addressed
Fish-bearing streams (300' buffer on either side of stream)	Physical Habitat – channel morphology, excessive fine sediment, instream roughness, lack of spawning gravel, riparian condition, wetland abundance and condition. Water Quality – temperature.
Permanently flowing non fish-bearing streams (150' buffer on either side of stream)	Physical Habitat – channel morphology, excessive fine sediment, instream roughness, lack of spawning gravel, riparian condition, wetland abundance and condition. Water Quality – temperature.
Lakes and natural ponds (300' buffer from edge of water body)	Physical Habitat – excessive fine sediment, riparian condition, wetland abundance and condition. Water Quality – temperature.
Seasonally flowing or intermittent streams (100' on either side of stream)	Physical Habitat – channel morphology, excessive fine sediment, instream roughness, lack of spawning gravel, riparian condition, wetland abundance and condition. Water Quality – temperature.

4. IMST Conclusions and Recommendations

The creation of the Riparian Reserves directly addresses conclusions and recommendations in several IMST reports. First, the IMST report entitled Recovery of Wild Salmonids in Western Oregon Forests: Oregon Forest Practices Act Rules and the Measures in the Oregon Plan for Salmon and Watersheds. Technical Report 1999-1 has numerous recommendations associated

with riparian reserves or buffers. In this report, the IMST states that riparian buffers, large wood, sediment from roads and landslides, and fish passage at road crossings are the most important habitat issues related to the recovery of salmonids in western Oregon forests. The ACS Riparian Reserves provide an expansive network of riparian buffers along 22,654 miles of streams that currently or are expected to serve as sources of large wood throughout the ESU. In addition, the Riparian Reserve standards and guides provide direction as to ways to protect the buffers (TM-1) and reduce sediment from existing and new roads (RF1-7). Fish passage at road crossings is addressed in "RF-6," which directs the BLM and FS to "Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams." Refer to Appendix 2 for Riparian Reserve standard and guides.

Second, the Riparian Reserves address several conclusions within the IMST report Defining and Evaluating Recovery of OCN Coho Salmon Stocks: Implications for rebuilding stocks under the Oregon Plan". Technical Report 1999-2. The IMST and workshop participants who contributed to the report cited the U.S. Fish and Wildlife Service definition of recovery: "*the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is the maintenance of secure, self sustaining wild populations of species with the minimum necessary investment of resources*." This definition served as a foundation to create three alternative definitions, two of which specifically referenced fresh-water habitat. Consequently, the report included several major conclusions that addressed the restoration of in-stream habitat, emphasizing the neutralization of threats, provide for quality freshwater habitat during times of poor ocean survival, and promoting widespread distribution of appropriate habitat conditions. The Riparian Reserves will help restore degraded riparian conditions through passive restoration and will (at varying degrees through time and space) help attain appropriate habitat conditions on BLM and FS-administered lands throughout the ESU.

Third, several conclusions provided by the IMST in the report entitled Influences of Human Activity on Stream Temperatures and Existence of Cold-Water Fish in Streams with Elevated Temperature: Report of a Workshop Independent Multidisciplinary Science Team. Technical Report 2000-2 are addressed by Riparian Reserves. In the report, the IMST states that human activities influence stream temperature by affecting one or more of the following: riparian vegetation, channel morphology, hydrology, and surface/subsurface interactions. The ACS Riparian Reserves promote continued growth of riparian vegetation along stream channels, which intercepts solar radiation—the principle energy source for stream heating. In addition, large wood inputs and bank stability will help create desired—narrow and deep—channel dimensions, decreasing the surface area/volume area and rate of temperature increase. The road network on BLM and FS-administered lands may detract from the desired surface/subsurface interactions, but road related standards and guides help address this issue.

Finally, the Riparian Reserves play a role in addressing conclusions raised by the IMST in the report Recovery of Wild Salmonids, in Western Oregon Lowlands. Technical Report 2002-1. Although this report is focused on unconstrained valley types, predominately occurring on non-federal lowlands, the IMST highlights the importance of building a connection between lowland and upland riparian areas. The IMST wrote that "management of lowland riparian zones in conjunction with those on adjacent uplands is needed to maintain the dynamics of riparian structure and function across the landscape" and that "Protection of intact, functional aquatic habitats should be the first priority for salmonid recovery efforts." The Riparian Reserve system tiers to these conclusions in that

where-ever BLM and FS-administered lands occur within the ESU the buffered streams can serve as an integral element to the creation of functional riparian corridors across land ownerships.

C. Key Watersheds

1. Description

Refugia are a cornerstone of most species conservation strategies. They are areas that either provide, or are expected to provide, high quality habitat, serving as a refuge network for salmon and other fish species. As part of the ACS, Key Watersheds were identified and designated to serve this purpose. Key Watersheds that are currently in good condition serve as anchors for the potential recovery of depressed fish stocks, while watersheds characterized by having low quality habitat and high potential for restoration can serve as future refuge areas (USDA and USDI 1994). The Key Watersheds are spatially distributed as to ensure that refugia area widely distributed across the landscape. The Tier 1 key watersheds have been identified as contributing directly to the conservation of at-risk salmonids. All Key Watersheds in the Oregon Coastal coho ESU are Tier 1 watersheds. Because Key Watersheds were identified has having a high value to native salmonids, they serve as focus areas for BLM and FS Watershed Analysis and Watershed Restoration programs, both of which will be described in greater detail.

2. Implementation within Oregon Coastal coho ESU

There are 34 Key Watersheds distributed throughout the four monitoring areas: North Coast (4), Mid-Coast (10), Umpqua (14), and Mid-South Coast (6). Further, the Key Watersheds are concentrated within 13 population units, covering 1,358,105 acres. Refer to Table 3 - Key Watersheds on BLM and FS-administered Lands within the Oregon Coastal coho ESU.

It should be noted that non-federal lands occur within Key Watersheds. For instance, there are 481 miles of coho bearing streams on federal lands compared to 421 miles on non-federal lands within the Key Watersheds, suggesting a predominance of federal land ownership. However, the majority of HIP stream miles occur on non-federal lands, reflecting the fact that the majority of low gradient streams occur on non-federal lands.

Because Key Watersheds currently serve or have potential to serve as strongholds for native salmonids, watershed analysis is required prior to implementation of land management activities. When the ACS was first implemented and watershed assessments were not completed, simple projects could be implemented without a watershed analysis but only when such actions were consistent with ACS Objectives. Under no conditions, however, could the BLM or FS proceed with timber harvest, including salvage, in a Key Watershed without watershed analysis.

Table 3 – Key Watersheds on BLM and FS-administered Lands within the Oregon Coastal coho

ESU*									
Monitoring Areas and Population Units	Key Watersheds (number of)	Key Watershed Acres	Coho-bearing Streams in Key Watersheds (total miles)		Coho- bearing streams in Key Watersheds (HIP miles)		Non-Coho Streams in Key Watersheds (total miles)		Agency
			Non Fed	Fed	Non Fed	Fed	Non Fed	Fed	
North Coast									
Ecola	-	-	-	-	-	-	-	-	-
Necanicum	-	-	-	-	-	-	-	-	-
Nehalem	0	0	0	0	0	0	0	0	
Neskowin	0	0	0	0	0	0	0	0	
Nestucca	1	88451	32.1	46.7	1.1	1.0	199	523	BLM/FS
Netarts	0	0	0	0	0	0	0	0	
Rockaway	-	-	-	-	-	-	-	-	-
Tillamook	3	29844	16.6	5.2	0.3	0.3	244.3	80.1	BLM
Mid-Coast									
Alsea	3	71748	45.7	49.9	10.5	4	139.5	352.1	BLM/FS
Beaver	1	7563	4.7	6.9	1.2	0.4	11.2	57.5	FS
Depoe Bay	-	-	-	-	-	-	-	-	-
Devils Lake	0	0	0	0	0	0	0	0	
Salmon	0	0	0	0	0	0	0	0	
Seal Rock	-	-	-	-	-	-	-	-	-
Siletz	2	38128	18.7	16.4	2.3	0.1	159.9	149.2	BLM/FS
Siuslaw	2	22980	14.2	29.2	3.2	1.5	17.2	155.8	FS
Thiel Creek	0	0	0	0	0	0	0	0	
Yachats	2	30781	28.4	23.8	7.7	1.6	65.9	220.3	FS
Yaquina	0	0	0	0	0	0	0	0	
Umpqua									
Lower Umpqua	5	128143	82.5	87	20.8	12.8	360.6	765.7	BLM/FS
Upper Umpqua	9	732192	105.2	121	13.6	4.7	1266.7	5084.5	BLM/FS
Mid-South Coast									
Cape Arago	-	-	-	-	-	-	-	-	-
Carter la ke	-	-	-	-	-	-	-	-	-
China Creek	-	-	-	-	-	-	-	-	-
Coos	1	24668	14.4	17.2	2.6	0.4	80.7	157	BLM
Coquille	3	123102	28	38.4	4.42	1.2	412.1	800.5	BLM/Fs
Floras	0	0	0	0	0	0	0	0	
Siltcoos	1	6364	6.4	4.4	2.4	0.0	21.3	43.5	BLM/FS
Sixes	1	10233	1.9	2.8	0.2	0.1	15.3	90.6	BLM/FS
Tahkenitch	0	0	0	0	0	0	0	0	
Tenmile	0	0	0	0	0	0	0	0	
Threemile Creek	-	-	-	-	-	-	-	-	-
Totals	**34**	**1,358,105**	**421**	**481**	**73**	**29**	**3,040**	**8,816**	

* The BLM and FS provided Key Watershed locations and boundaries to the ODFW Corvallis Research Lab, who then assigned each watershed a monitoring and population unit along with stream miles.

3. ODFW Factors for Decline

The mere presence of Key Watersheds does not offer additional protection beyond that provided by Riparian Reserves. Because many of the Key Watersheds were identified as strongholds for steelhead and salmon, a case might be made that such watersheds help curtail the depletion of wild stocks, an idea which is discussed further in part "4" of this section. Refer to Table 4 – ACS key Watersheds and ODFW Factors for Decline.

Table 4 – ACS Key Watersheds and ODFW Factors for Decline

Key Watersheds	ODFW Factor of Decline Addressed
Tier 1	Other Fish Issues – depletion of wild stocks
Tier 2	No Tier 2 watersheds to be addressed

4. IMST Conclusions and Recommendations

The identification and designation of Key Watersheds directly addresses several IMST reports. In the report titled Defining and Evaluating Recovery of OCN Coho Salmon Stocks: Implications for rebuilding stocks under the Oregon Plan. Technical Report 1999-2, the IMST states under major conclusion "4b" that "Widespread distribution of salmon populations in watersheds and appropriate habitat conditions must be achieved during periods of good survival to provide a buffer against subsequent periods of poor survival." The Key Watersheds help address this conclusion in that they are widely distributed across the ESU and offer or will offer quality habitat through the Riparian Reserves. In addition, these watersheds are priority areas for watershed analysis and targeted restoration, both of which will be discussed later in this report.

Next, the Key Watersheds can be applied to the metapopulation concept described in the IMST report Recovery of Wild Salmonids, in Western Oregon Lowlands. Technical Report 2002-1. The IMST describes a metapopulation as groups of populations that are linked by migration of individuals. Applied to the coho, the Oregon lowlands, characterized by low-gradient stream reaches, serve as strongholds for the core populations while the more mountainous and higher gradient streams may serve as places for the less persistent satellite populations. Such a core/satellite complex forms a group that is linked to other such groups.

The 34 Key Watersheds likely play a role in maintaining or securing metapopulation groups distributed throughout the ESU. For instance, most federal lands in Key Watersheds have significant miles of coho-bearing streams, but most of the HIP stream reaches are concentrated on non-federal lands. For this reason, it can be assumed that most core areas are concentrated in the non-federal lowlands while the satellite areas are supported by the federally owned portions of the watersheds. If the HIP stream miles on non-federal lands are in a degraded condition, however, the coho-bearing streams under ACS management (or satellite areas) may offer the best available habitat for a group of coho within a metapopulation. Because of time limitations, the BLM and FS could not conduct an in-depth assessment to determine the ways in which the spatial distribution of Key Watersheds may contribute to the viability of Oregon Coastal coho.

D. Watershed Analysis

1. Description

Watershed analysis is essentially ecosystem analysis at the watershed scale and provides the context for fishery protection, restoration, and enhancement efforts. The understanding gained through watershed analysis is critical to sustaining the health and productivity of natural resources. The watershed analysis process used by the BLM and FS is found in the document entitled Ecosystem Analysis at the Watershed Scale. Federal Guide for Watershed Analysis, which includes a six step process: 1. Characterization of the watershed 2. Identification of issues and key questions 3. Description of current conditions 4. Description of reference conditions 5. Synthesis and interpretation of information 6. Recommendations.

The analysis is conducted by an interdisciplinary team consisting of geomorphologists, hydrologists, soil scientists, biologists and other specialists as needed. Information used in this analysis includes: maps of topography, stream networks, soils, vegetation, and geology; sequential aerial photographs; field inventories and surveys including landslide, channel, aquatic habitat, and riparian condition inventories; census data on species presence and abundance; water quality data; disturbance and land use.

The results of watershed analyses may include a description of the resource needs, capabilities, opportunities, range of natural variability, spatially explicit information that will facilitate environmental and cumulative effects analyses for NEPA, and the processes and functions operating within the watershed. Further, the participation of adjacent landowners, private citizens, interest groups, industry, various government agencies, and others in watershed analyses is promoted.

Finally, watershed Analysis provides the contextual basis at the site level for decision makers to set appropriate boundaries of Riparian Reserves, plan land use activities compatible with disturbance patterns, design road transportation networks that pose minimal risk, identify what and where restoration activities will be most effective, and establish specific parameters and activities to be monitored. More detailed site-level analysis is conducted to provide the information and designs needed for specific projects (*e.g.*, timber sale layout) so that riparian and aquatic habitats are protected.

2. Implementation within Oregon Coastal coho ESU

From 1994 to 2003, the BLM and FS completed 114 watershed assessments for BLM and FS-administered lands within the Oregon Coastal coho ESU. They are distributed across the four monitoring areas in the following manner: North Coast (7), Mid-Coast (23), Umpqua (59), and Mid-South Coast (23). One-hundred and nine watershed analyses were completed in 13 population units, those areas that contain the 34 Key Watersheds. Refer to Table 5 – Watershed Analysis on BLM and FS-administered Lands in the Oregon Coastal coho ESU. Many of the assessments were conducted in the mid to late 1990s and may be lacking current information; however, all such assessments should provide enough information as to direct BLM and FS staff to those areas within the aquatic environment that require further analysis.

Table 5 – Watershed Analysis on BLM and FS-administered Lands in the Oregon Coastal coho ESU

Oregon Coastal coho Monitoring Areas and Population Units	Watershed Analysis (# completed)	Presence of and number of Key Watersheds	Agency	Year/s Completed
North Coast				
Ecola	-*	-	-	-
Necanicum	-	-	-	-
Nehalem	2	None	BLM	1997
Neskowin	0	None		-
Nestucca	2	Yes (1)	BLM/FS	1994-1998
Netarts	0	None		-
Rockaway	-	-	-	-
Tillamook	3	Yes (3)	BLM	1997-In Progress
Mid-Coast				
Alsea	6	Yes (3)	BLM/FS	1995-1999
Beaver	1	Yes (1)	FS	2001
Depoe Bay	-	-	-	-
Devils Lake	1	None	-	-
Salmon	0	None	-	-
Seal Rock	-	-	-	-
Siletz	3	Yes (2)	BLM/FS	1996-1999
Siuslaw	9	Yes (2)	BLM/FS	1994-1998
Thiel Creek	0	None	-	-
-Yachats	3	Yes (2)	FS	1995-1997
Yaquina	1	None	FS	1995
Umpqua				
Lower Umpqua	11	Yes (5)	BLM/FS	1994-1998
Upper Umpqua	48	Yes (9)	BLM/FS	1994-2003
Mid-South Coast				
Cape Arago	-	-	-	-
Carter lake	-	-	-	-
China Creek	-	-	-	-
Coos	5	Yes (1)	BLM	1996-2001
Coquille	16	Yes (3)	BLM/FS	1995-2001
Floras	0	None		
Siltcoos	1	Yes (1)	FS	1998
Sixes	2	Yes (1)	FS	1997-1999
Tahkenitch	1	None	FS	1998
Tenmile	0	None		
Threemile Creek	-	-	-	-
Total	**114**	**34**		

* "-" indicates that no BLM or FS-administered lands occur within a population unit

3. ODFW Factors for Decline

Most BLM and FS watershed analysis in the Oregon Coastal coho ESU identified coho as a species of primary concern and included assessments of coho spawning and rearing habitats. Factors for Decline which have been commonly identified for specific watersheds include those related to physical habitat, water quality, water quantity, and biological condition. The degree at which these factors for decline are addressed by individual watershed assessments varies, some being more detailed than others. Refer to Table 6 – Watershed Analysis and ODFW Factors for Decline

Table 6 – ACS Watershed Analysis and ODFW Factors for Decline	
Factor for Decline Category	**Category Elements**
Physical Habitat	channel morphology, estuarine habitat condition, excessive fine sediment, instream roughness, lack of spawning gravel, passage impediments, riparian condition, wetland abundance and condition
Water Quality	temperature
Water Quantity	altered streamflows, insufficient streamflows

4. IMST Conclusions and Recommendations

Watershed Analysis has been recommended by the IMST as a recovery tool in several reports, those being Recovery of Wild Salmonids in Western Oregon Forests: Oregon Forest Practices Act Rules and the Measures in the Oregon Plan for Salmon and Watersheds. Technical Report 1999-1, Defining and Evaluating Recovery of OCN Coho Salmon Stocks: Implications for rebuilding stocks under the Oregon Plan". Technical Report 1999-2 and Recovery of Wild Salmonids, in Western Oregon Lowlands. Technical Report 2002-1. In Technical Report 1999-1, watershed assessments are those that describe conditions of upslope and riparian forest and associated aquatic systems to determine what is required to reach desired conditions. In 1999-2, Recommendation 6 suggested that assessments should incorporate the historic range of habitat conditions across a landscape and, more importantly, future alternative habitat patterns across the landscape. Finally, under Recommendation 1 of the lowlands report, the IMST provides specific steps for evaluating a landscape and include evaluating current and historic watershed hydrologic regimes, prioritizing protection and restoration based on assessment of factors that affect salmonids. In many ways, the Ecosystem Analysis at the Watershed Scale. Federal Guide for Watershed Analysis used by the BLM and FS to complete 114 watershed assessments in the ESU tiers to the IMST recommendations for ways to conduct assessments.

E. Watershed Restoration

1. Description

Watershed restoration is a program, based on watershed analysis that helps restore a watershed's hydrological and ecological processes that are necessary to ensuring the long-term recovery of fish populations and water quality. The BLM and FS watershed restoration program targets key watersheds and is holistic, whereby projects cover uplands (i.e. conifer thinning, controlled burning, and road decommissioning), riparian areas (i.e. conifer or hardwood thinning), and stream channels (i.e. large wood, boulders). Aquatic restoration projects presented in this report can be found in Table 7 – Watershed Restoration on BLM and FS-administered lands in the Oregon Coastal coho ESU from 1998-2003 and are summarized into six categories:

i. **In-stream Structures:** Includes actions designed to change or modify stream complexity and structure, including but not limited to placement of large woody debris, construction of weirs/deflectors, creation of pools, placement of boulders, rock gabions, gravel placement, development or improvement of side channels, alcoves, or other actions designed to improve stream structure.
ii. **In-stream Passage:** Includes actions designed to protect and improve fish passage for juvenile or adult fish including but not limited to: culvert removal, culvert upgrade, fish ladders improved or installed, irrigation diversions, fish screens
iii. **Riparian Improvements:** Includes actions designed to improve, restore, or maintain quality and/or conditions of riparian zone vegetation; including but not limited to planting, fencing, off channel watering, beaver management, invasive plant control, livestock rotation or other management, stand conversion.
iv. **Road Decommissioning:** Includes actions designed to make roads hydrologically stable and self-maintaining. Actions may range from full obliteration to water barring along with culvert removal.
v. **Road Improvement:** Includes actions/activities designed to reduce sediment and improve stability or to allow more natural functioning of stream and flood plain - including but not limited to drainage, upgrades, stabilization, and relocation.
vi. **Wetlands (Freshwater) Improvements:** Activities designed to create, maintain, or restore freshwater wetland habitat.

2. Implementation within Oregon Coastal coho ESU

Between 1998 and 2003, the BLM and FS have implemented numerous aquatic restoration activities throughout BLM and FS-administered lands in the Oregon Coastal coho ESU. Most, if not all, are based on watershed analysis and were implemented in the stream channel, riparian areas, and upland zones. Table 7 – Watershed Restoration on BLM and FS-administered lands in the Oregon Coastal coho ESU from 1998 -2003 summarizes the restoration actions by monitoring area and population unit. For example, 161.5 miles of stream channel were enhanced, primarily with placement of large wood. Culvert replacements removed passage barriers, opening 162.5 miles of habitat. Within the riparian zones, 545 miles of stream-side areas were planted with native trees and shrubs. To reduce sedimentation into stream channels, 274.5 miles of roads were decommissioned and 395.6 miles of roads were improved. The combined cost of these restoration projects totaled $22,115,962. As seen on Table 7, most of the restoration work was implemented within Key Watersheds, totaling $21,585,658.

Table 7 – Watershed Restoration on BLM and FS-administered lands in the Oregon Coastal coho ESU from 1998-2003

Oregon Coastal coho Monitoring Areas and Population Units	Key Watershed (number of)	In-stream Projects (miles)	Barrier Removal (miles)	Riparian planting (miles)	Roads Decommi. (miles)	Road Improvement (miles)	Wetland Restoration (acres)	Project Cost ($)	Agency
North Coast									
Ecola	-	-	-	-	-	-	-	-	-
Necanicum	-	-	-	-	-	-	-	-	-
Nehalem		0.0	0.0	0.0	0.3	0.1	0.0	29,000	BLM
Neskowin	None	0.0	0.0	0.0	0.0	0.5	0.0	1,000	FS
Nestucca	Yes (1)	6.0	1.3	0.0	15.8	44.2	0.0	710,735	BLM
		0.8	0.0	24.7	0.6	0.8	0.0	454,000	FS
Netarts	None	0	0	0	0	0	0	0	
Rockaway	-	-	-	-	-	-	-	-	-
Tillamook	Yes (3)	0.0	0.0	0.0	0.0	7.5	0.0	66,817	BLM
Mid-Coast									
Alsea	Yes (3)	4.4	7.9	1.4	20.6	22.6	0.0	1,049,673	BLM
		11.0	0	17.5	8.9	7.3	0.0	1,171,000	FS
Beaver	Yes (1)	0	0	0	1.6	0.7	0.0	84,000	FS
Depoe Bay	-	-	-	-	-	-	-	-	-
Devils Lake	None	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Salmon	None	0.0	0.0	0.0	4.5	0.2	0.0	42,550	BLM
		0.0	0.0	0.0	0.0	0.2	0.0	248,000	FS
Seal Rock	-	-	-	-	-	-	-	-	-
Siletz	Yes (2)	0.0	1.5	0.0	15.2	13.7	0.0	375,000	BLM
		0.0	0.0	0.4	3.5	2.0	0.0	227,000	FS
Siuslaw	Yes (2)	8.0	11.9	0.0	3.4	0.0	0.0	706,500	BLM
		25.6	0.0	2.5	14.3	12.0	0.0	1,752,000	FS
Thiel Creek	-	-	-	-	-	-	-	-	-
Yachats	Yes (2)	0.1	0.0	0.0	9.9	12.2	0.0	1,025,000	FS
Yaquina	None	0.3	0.0	0.3	0.0	0.0	0.0	22,754	BLM
		0.0	0.0	0.0	7.5	1.7	0.0	110,000	FS
Umpqua									
Lower Umpqua	Yes (5)	20.1	40.3	0.0	22.2	5.8	0.0	1,948,577	BLM
		21.8	0.0	0.3	8.6	0.1	0.0	816,000	FS
Upper Umpqua	Yes (9)	7.8	71.9	0.0	15.5	160.7	0.0	3,842,029	BLM
		23.6	3.0	2.3	90.8	67.8	0.0	5,195,525	FS
Mid-South Coast									
Cape Arago	-	-	-	-	-	-	-	-	-
Carter lake	-	-	-	-	-	-	-	-	-
China Creek	-	-	-	-	-	-	-	-	-
Coos	Yes (1)	9.6	2.5	1.8	2.0	0.0	0.0	171,000	BLM
Coquille	Yes (3)	14.2	21.8	0.0	20.4	35.4	10.5	1,801,720	BLM
		3.0	0.0	0.1	0.0	0.0	0.0	73,342	FS
Floras	None	1.0	0.5	0.0	0.0	0.0	0.0	79,000	BLM
Siltcoos	Yes (1)	2.0	0.0	0.4	9.0	0.0	0.0	38,000	FS
Sixes	Yes (1)	2.2	0.0	0.0	0.0	0.0	0.0	74,000	BLM
Tahkenitch	None	0.0	0.0	0.7	0.0	0.0	0.0	2000	FS
Tenmile	None	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Threemile Cr.	-	-	-	-	-	-	-	-	-
Total	**34**	**161.5 (104)***	**162.5 (103)**	**545 (53)**	**274.5 (207)**	**395.6 (201)**	**10.5 (1)**	**$22,115,962 ($21,581,658)**	

***** Restoration Projects within Key Watersheds

3. ODFW Factors for Decline

As seen in Table 8 – Watershed Restoration and ODFW Factors for Decline, actions within each of the five restoration categories directly address ODFW Factors for Decline. For example, the in-stream structures, most of which consist of large wood and boulder placement, have beneficial effects on channel morphology, in-stream roughness, and spawning gravel. Under the in-stream passage category, culvert replacement or removals not only restores fish passage but enhances channel morphology by restoring natural channel dimensions and gradient. The primary restoration actions that alleviate anthropogenic sedimentation into stream channels are those involving roads, such as road decommissioning and improvement projects.

Table 8 – ACS Watershed Restoration and ODFW Factors for Decline

Restoration Category	ODFW Factors for Decline – Category and Elements
In-stream Structure	Physical Habitat – channel morphology, in-stream roughness, lack of spawning gravel.
In-stream Passage	Physical Habitat - channel morphology, passage impediments
Riparian Improvements	Physical Habitat – riparian condition
Road Decommissioning	Physical Habitat – excessive fine sediment, riparian condition Water Quantity – altered stream flows
Road Improvements	Physical Habitat – excessive fine sediment Water Quantity – altered stream flows
Wetland Improvements	Physical Habitat – wetland abundance and condition

4. IMST Conclusions and Recommendations

The IMST report entitled Recovery of Wild Salmonids in Western Oregon Forests: Oregon Forest Practices Act Rules and the Measures in the Oregon Plan for Salmon and Watersheds. Technical Report 1999-1 presents priority restoration actions. The IMST states that riparian buffers, large wood, sediment from roads and landslides, and fish passage at road crossings are the most important habitat issues related to the recovery of salmonids in western Oregon forests. Along with Riparian Reserves, which ensures passive restoration along 22,654 miles of streams, the restoration actions implemented by the BLM and FS strongly correlate with the four restoration categories recommended by the IMST.

IV. Conclusions

The ACS, a core piece of the Northwest Forest Plan, was created to address at-risk fish stocks occurring on BLM and FS-administered lands within the range of the northern spotted owl. The primary parts of the ACS include objectives and four components, those being Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration.

The ACS includes nine objectives, all of which guide the management on all BLM and FS-administered lands within the NWFP area as to maintain and restore ecosystem health at watershed and landscape scales to protect fish habitat and other riparian resources. At the project level, BLM and FS decision makers must conclude that any action must "meet," "not adversely affect," "not retard attainment of," or otherwise achieve attainment of ACS objectives at the watershed scale. In of themselves, the ACS Objectives do not specifically address the ODFW Factors for Decline but provide guidance for BLM and FS decision makers to move in a direction that directly addresses ODFW Physical Habitat, Water Quality, and Water Quantity factor of decline categories. Likewise, the ACS objectives tier to IMST recommendations in Technical Report 1991-1. In this report, the IMST recommended the creation of "Goals that ensure the integrity of salmonid habitat should be identified for the characteristics of aquatic systems and riparian and upslope forest across the landscape." In total, the ACS Objectives strongly tier to this goal in that they promote the restoration of landscape processes—channel, riparian, and upslope—that are required for functional aquatic systems and associated riparian dependent species, including fish. A primary means to attain the ACS objectives is through the implementation of the four ACS components: Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration.

As the first of four ACS components, the Riparian Reserves apply to all BLM and FS-administered lands within the ESU and result in protected buffers along all streams. Consequently, a 300' (minimum) buffer strip exists on either side of the 1,342 miles of coho-bearing streams that flow through the BLM and FS-administered lands, comprising 20% of all coho-bearing streams in the ESU. Of these streams, 131 miles are documented as having HIP, approximating 10% of HIP streams in the ESU. Further, there is an additional 21,312 miles of streams on BLM and FS-administered lands that do not contain coho but serve as important sources of large wood to coho-bearing streams. Through natural processes, the buffers help maintain the integrity of aquatic systems by (1) influencing delivery of course sediment, organic matter, and woody debris to streams, (2) providing root strength for channel stability, (3) shading the stream, and (4) protecting water quality. Such results address ODFW Factors for Decline, most of which are found in the Physical Habitat and Water Quality categories. Furthermore, the Riparian Reserves implement important IMST recommendations, which include creating riparian buffers as a recovery action (Technical Report 1999-1), providing for widespread distribution of quality habitat (Technical Report 1999-2), promoting conditions that maintain acceptable stream temperatures (Technical Report 2000-2), and maintaining connections between lowland and upslope riparian areas (Technical Report 2002-1).

The Key Watersheds, which constitute the second of the four ACS components, are a series of watersheds that are distributed across BLM and FS-administered lands. They have been identified as important refugia or strongholds for native salmonids. Within the 34 Key Watersheds distributed across the Oregon Coastal coho ESU, 481 miles of coho-bearing streams flow through BLM and FS-administered lands while 421 miles flow through non-federal portions of these watersheds. Conversely, the HIP streams are predominately within the non-federal portions of these watersheds. The network of Key Watersheds helps implement IMST recommendations that promote "Widespread distribution of salmon populations and appropriate habitat conditions…" (Technical Report 1999-2) and serve as possible strongholds for metapopulation groups (Technical Report

2202-1). Under the ACS, Key Watersheds are extremely important in that they are focal areas for Watershed Analysis and Watershed Restoration, the third and fourth components of the ACS.

Key Watersheds were the primary focus of Watershed Analysis, the third or four ACS components. From 1994 to 2003, the BLM and FS completed 114 watershed assessments for BLM and FS-administered lands throughout the Oregon Coastal coho ESU, 109 of which were completed in 13 population units, those areas that contain the 34 Key Watersheds. The watershed analysis identified factors that limited the attainment of ACS objectives, including desired habitat conditions for native salmonids, primarily coho ,Chinook salmon, and steelhead. Finally, the watershed analysis served as an intermediary step towards restoration of Key Watersheds within the Oregon Coastal coho ESU, the foundation from which BLM and FS fisheries biologists and hydrologists targeted limited resources towards habitat restoration projects.

Watershed restoration, the fourth and final component of the ACS, is a program based on watershed analysis, directed at key watersheds, and helps restore a watershed's hydrological and ecological processes that are necessary to ensuring the long-term recovery of fish populations and water quality. The ACS watershed restoration program is holistic, whereby projects cover uplands (i.e. conifer thinning, controlled burning, and road decommissioning), riparian areas (i.e. conifer or hardwood thinning), and in-channel projects (i.e. large wood, boulders). Between 1998 and 2003, the BLM and FS improved 161.5 miles of stream channel, removed passage barriers and opened 162.5 miles habitat, planted 545 miles of stream-side zones with native trees and shrubs, decommissioned 274.5 miles of roads, and improved 395.6 miles of roads at a total cost of $22,115,962. Most of the restoration work was concentrated within Key Watersheds, totaling $21,585,658. In other words, 98% of the aquatic restoration funds were directed at key watersheds, those areas identified as currently or potentially being refugia for native salmonids. The remaining streams and riparian areas not targeted for active restoration, however, are covered under the protective umbrella of Riparian Reserves. Therefore, all stream channels and riparian areas are in a continual process of restoration, either through active restoration, passive restoration, or both.

In summary, this report documented the implementation of the Northwest Forest Plan ACS on BLM and FS-administered lands within the Oregon Coastal coho ESU. It demonstrates the ways in which the BLM and FS have worked to meet ACS objectives through implementation of the four ACS components—riparian reserves, key watersheds, watershed analysis, and watershed restoration. Also, it was a goal to illustrate how these components worked together to maintain and restore productivity and resiliency of riparian and aquatic ecosystems. The Riparian Reserves serve as a restorative foundation for all streams and riparian areas on BLM and FS-administered lands, while the Watershed Analysis and associated Watershed Restoration programs target Key Watersheds. What this report does not do is speculate on the effects of the ACS on recovery of the Oregon Coastal coho, but it does provide essential information to the State Assessment Team who will determine the relative affects of various management activities on the recovery of this fish.

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Appendix 1 – The PECE Policy as Addressed by the Northwest Forest Plan Aquatic Conservation Strategy

Prepared by

Certainty that the Northwest Forest Plan will be implemented.

1. Describe the staffing, funding level, funding source, and other resources necessary (and available) to implement the conservation effort or regulatory program.

Since inception of the Northwest Forest Plan (NWFP), annual Bureau of Land Management (BLM) and Forest Service (FS) budgeting has provided for the implementation of the Aquatic Conservation Strategy (ACS) within the Oregon Coastal coho (OC Coho) Evolutionary Significant Unit (ESU). Congressional allocations have ranged from $3,600,000 to $3,400,000 in 2003 and 2005, respectively. Refer to Table 1 – BLM and FS ACS funding levels from 2000 to 2005 in the Oregon Coastal coho ESU. We expect similar or slight reductions in future budget allocations (Table 1). These funds have been used for the identification and adoption of the riparian reserve system which now includes 22,633 miles of riparian corridor, the designation of 34 key watersheds, the completion of 114 watershed assessments, and the completion of watershed restoration projects. In addition, annual budgeting has provided for the staffing to implement the NWFP. Key staff involved with implementation of the ACS is fisheries biologists, hydrololgists, and geomorphologists, which includes approximately 15 FTEs in the BLM and 16 FTEs in the FS.

Table 1 – BLM and FS ACS funding levels from 2000 to 2005 in the Oregon Coastal coho ESU.

Administrative Unit	Fiscal Year		
	2003	2004	2005
BLM	$1,900,000	$1,900,000	$1,900,000
FS	$1,700,000	$1,500,000	$1,500,000
***Total**	$3,600,000	$3,400,000	$3,400,000

* Does not include sources of restoration funds from engineering, Payments to counties, etc,

Under the NWFP, implementation of the ACS Objectives and Standards and Guides (S&G) provide overarching guidance for management actions. Therefore, all BLM and Forest Service management actions shall comply with the ACS Objectives and Standard and Guidelines. For example, when a culvert at a road crossing that is a barrier to fish movement is replaced, engineers must design the culvert to pass all life stages of fish. Also, timber sales must be designed to be in compliance with ACS Objectives and Standard and Guides.

Staffing, funding level, funding source, and other resources necessary are available to implement the NWFP into the foreseeable future.

2. Describe the legal authority to implement and the commitment to proceed with the conservation effort or regulatory program.

The 1994 NWFP Record of Decision either amended or was incorporated into approximately 26 USFS and BLM land and resource management plans and two regional guides. This is the legal authority to implement the NWFP. The BLM and Forest Service commitment to proceed with the NWFP Aquatic Conservation Strategy has been demonstrated in main body of the report. Within the OC Coho ESU, the BLM and Forest Service have implemented the four ACS components—establishing 22,785 miles of riparian reserves, designating 34 key watersheds, completing 114 watershed analysis, and implementing watershed restoration projects in the stream channels, riparian areas, and associated uplands.

In March 2004, the Under Secretary of Agriculture for Natural Resources and the Environment and the Assistant Secretary of the Interior for Land and Minerals Management amended the 1994 Northwest Forest Plan to clarify provisions relating to the Aquatic Conservation Strategy (ACS).

3. Describe the legal procedural requirements (e.g. environmental review), if any exist, necessary to implement the effort or regulatory program.

To implement the NWFP, the BLM and FS must be in compliance with the following federal environmental laws:

National Environmental Policy Act (NEPA)
The Council on Environmental Quality (CEQ) NEPA implementing regulations (40 CFR 1500-1508) apply to both the BLM and Forest Service. The NEPA requires that federal agencies prepare detailed statements on proposed actions that significantly affect the quality of the human environment. The BLM and Forest Service have both integrated NEPA reviews with their land management planning regulations. For each agency, an environmental impact statement (EIS) accompanies its land management plans. The Forest Service and BLM will tier to the Final SEIS in NEPA documents on specific activities.

National Forest Management Act (NFMA)
The Northwest Forest Plan complies with planning regulations under the National Forest Management Act (NFMA), promulgated in 1982 (36 CFR 219). NFMA is an amendment to the Forest and Rangeland Renewable Resources Planning Act. In NFMA Congress established a comprehensive notice and comment process for adopting, amending and revising land and resource management plans ("forest plans") for units of the National Forest System. At the time of enactment of NFMA, ecological concepts and practices did not address ecosystem scales of the magnitude dealt with in this decision. The 24.5 million acres of land administered by the federal government within the range of the northern spotted owl is far beyond the "planning unit" focus of NFMA. 16 U.S.C. §§ 1604 and 1611.

Further, the NFMA requires the Secretary of Agriculture to promulgate regulations to guide Forest Service planning. One of the statutory requirements is "specifying guidelines for land management plans developed to achieve the goals of the Program which provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." 16 U.S.C. § 1604(g)(3)(B). In accord with this diversity provision, the Secretary promulgated a regulation that provides in part: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." 36 C.F.R. § 219.19.

Federal Land Policy and Management Act (FLPMA)
The BLM's land use planning authority is provided in FLPMA, 43 U.S.C. Sec. 1712. Regulations to implement that authority are 43 CFR Subpart 1610. The principles of multiple use and sustained yield have been applied in the development of the Northwest Forest Plan. This is evident by the designation of reserves where benefits to late-successional forest related species and uses are emphasized, and the designation of matrix lands where the economic and social benefits of timber harvest are emphasized on a sustainable basis. In addition, the designation of some adaptive management areas allows the development of innovative human uses of the forests that are compatible with wildlife habitat needs. The opportunity for utilization of resources from the lands under the standards and guidelines of this decision is in accordance with the principles of multiple use and sustained yield (see 43 U.S.C. § 1712(c) (1)).

Oregon and California Lands Act
The management of the O&C lands is governed by a variety of statutes, including the O&C Lands Act, FLPMA, the Endangered Species Act, and the Clean Water Act. The O&C Lands Act requires the Secretary of the Interior to manage O&C lands for permanent forest production; however, such management must also be in accord with sustained-yield principles. Further, that Act requires that management of O&C lands protect watersheds, regulate streamflow, provide for recreational facilities, and contribute to the economic stability of local communities and industries.

Section 5(a) of the Act also directs: "the Secretary, and the Secretary of Agriculture with respect to the National Forest System, shall establish and implement a program to conserve fish, wildlife, and plants, including those which are listed as endangered species or threatened species pursuant to Section 4 of this Act." 16 U.S.C. § 1534(a).

Endangered Species Act (ESA)
Section 7(a) (2) of the Endangered Species Act (ESA) requires that Federal agencies consult with the U.S. Fish and Wildlife Service and NOAA Fisheries, as appropriate, to ensure that their actions are not likely to: (1) jeopardize the continued existence of species listed as threatened or endangered under the ESA; or, (2) destroy or adversely modify designated or proposed critical habitat. The BLM and Forest Service initiated formal consultation with NOAA Fisheries and the U.S. Fish and Wildlife Service on the continued implementation of the RMPs as amended by the Northwest Forest Plan. The NOAA Fisheries concluded in their biological opinions that implementation of the RMPs as amended by this decision is not likely to jeopardize the continued existence Oregon Coastal coho or, destroy or adversely modify OC Coho designated or proposed critical habitat.

Coastal Zone Management Act
Implementation of the Northwest Forest Plan is expected to meet or exceed the federal and state standards and policies adopted in federally approved, state coastal management programs and coastal non-point pollution control programs. Appropriate consultation will occur on subsequent plans and activities to ensure consistency under the Coastal Zone Management Act and Coastal Zone Act Reauthorization Amendments.

Executive Order 11990 - Protection of Wetlands

The NWFP complies with Executive Order 11990 by incorporating procedures and measures for identification, assessment and protection of wetlands. All practicable measures to minimize harm to wetlands will be implemented. The primary measures that ensure compliance include the designation of riparian reserves and key watersheds, the watershed analysis process, and watershed restoration. These measures ensure that wetlands on lands administered by the Forest Service and BLM within the OC Coho ESU will be maintained as natural systems providing public health, safety, welfare, and other public interest values.

Federal Clean Water Act

Full implementation of the Northwest Forest Plan is expected to maintain and improve water quality. We base this finding on the extensive water quality protection provided by the plan's comprehensive watershed-based approach. The system of late-successional reserves and riparian reserves, watershed restoration, and the other components of the preferred alternative's ACS provide a sound framework for meeting Clean Water Act requirements. The system of riparian reserves provides protection zones around streams, wetlands, and water bodies minimizing the potential for sediment, temperature, and dissolved oxygen problems. The riparian reserves will contribute to protecting or restoring the physical, chemical, and biological integrity of waters of the United States, the major goal of the Clean Water Act. Analysis to support subsequent levels of planning and site-specific projects and implementation of monitoring and adaptive management will be required to demonstrate compliance with the Clean Water Act and state water quality standards.

Protection of Tribal Treaty Rights and Trust Resources

American Indian treaty rights and trust resources will be protected under the NWFP. The decision to implement the NWFP influences management of the Coquille Forest. These lands are part of the Coquille Indian Reservation located in the OC Coho Mid-South Coast monitoring area, and are held in trust by the United States. An Act of Congress in 1996 transferred ownership of about 5,400 acres of federal land within the Northwest Forest Plan area to the Coquille Indian Tribe. The Act required that the Coquille Forest be managed subject to the same direction as adjacent or nearby federal lands. The decision has effects on tribal treaty rights and trust resources similar to the Northwest Forest Plan.

Valid Existing Rights

This decision does not repeal valid existing rights on public lands. Valid existing rights are those rights or claims to rights that take precedence over the actions contained in this plan. Valid existing rights may be held by other Federal, State or local government agencies or by private individuals or companies. Valid existing rights may pertain to mining claims, mineral or energy easements, rights-of-way, reciprocal rights-of-way, leases, agreements, permits, and water rights.

BLM Manual 6840 – Special Status Species Management

The purpose of this Manual Section is to provide policy and guidance, consistent with appropriate laws, for the conservation of special status species of plants and animals, and the ecosystems upon which they depend. These are species which are proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the ESA; those listed by a State in a category such as threatened or endangered implying potential endangerment or extinction; and those designated by each State Director as sensitive. Conservation in this section and pursuant to the ESA means the use of all methods and procedures which are necessary to improve the status of federally listed species and their habitats to a point where the provisions of the ESA are no longer necessary. Conservation of special status species means the use of all methods and procedures

which are necessary to improve the condition of special status species and their habitats to a point where their special status recognition is no longer warranted.

4. Describe the authorizations (e.g., permits, landowner permission), if applicable, necessary to implement the conservation effort or regulatory program. Describe the level of certainty that these authorizations will be obtained.

Clean Water Act
Certain fish restoration projects implemented under the Northwest Forest Plan, such as culvert replacement to improve fish passage and large woody debris placement, require Section 404 permits from the U.S. Army Corps of Engineers. From 1998 to 2001 the Forest Service and BLM installed 250 instream habitat improvement structures that restored 161.5 miles of aquatic habitat. During this same time period, both agencies restored fish passage to 162.5 miles of stream. Projects such as these complied with Section 404 requirements. Both agencies will continue to obtain all necessary permits in the future. These actions are subject to ESA section 7 consultation requirements, which may result in conditions designed to achieve the intended purpose of the project and avoid or reduce impacts to coho salmon and its habitat within the range of the listed ESU.

Endangered Species Act (ESA)
Many actions implemented under the Northwest Forest Plan must proceed through Section 7 of the ESA to ensure that such actions do not threaten the continued existence of ESA-listed species. For instance timber sales, recreation projects, and other ground disturbing events that may affect aquatic systems in which ESA-listed species depend upon must proceed through Section 7 consultation. The consultation process results in terms and conditions to ensure that such projects comply with the ESA. Because aquatic restoration projects are designed to improve the conditions of BLM and FS-administered aquatic resources, the consultation process results in few if any changes to the design or implementation process.

Sections 10(a) (1) (A) and 10(a) (1) (B) of the ESA provide NOAA Fisheries with authority to grant exceptions to the ESA's ''taking'' prohibitions (see regulations at 50 CFR 222.22 through 222.24). Section 10(a) (1) (A) scientific research and enhancement permits may be issued to entities (Federal and non-Federal) conducting research that involves direct take of listed species.

The NOAA Fisheries has issued section 10(a)(1)(A) research or enhancement permits for OC Coho salmon for a number of activities, including Federal sampling efforts for coho salmon in the Oregon Coast ESU, to determine population distribution and abundance.

Oregon Removal and Fill Act
The BLM and FS has and continues to acquire Oregon Division of State Lands in-water work permits for aquatic restoration and other projects that occur within the waters of the state of Oregon.

Landowner Permission
Implementation of the Northwest Forest Plan does not require obtaining permission from any non-federal land owner. However, the Forest Service and BLM work collaboratively with affected land owners either individually or through watershed councils to develop and implement restoration projects. Through the Wyden Amendment, federal agencies contribute funding to complete restoration on non-federal lands that benefit resources on federal land. Partnerships with state agencies, organizations,

and private individuals are developed to leverage federal funds through Challenge Cost Share and Cooperative Conservation Initiative agreements. Other funding support is provided by Jobs-in-the-Woods, Title II, Clean Water and Watershed Restoration, and other sources.

5. Describe the type and level of voluntary participation necessary to implement the conservation effort or regulatory program. Describe the level of certainty that this level of voluntary participation will be achieved.

Implementation of the Northwest Forest Plan and subsequent planning is non-discretionary. There is no voluntary component necessary to achieve the objectives contained in the NWFP. However, both the FS and BLM work closely with non-federal entities in the OC Coho ESU to improve watershed conditions.

6. Are necessary regulatory mechanisms (e.g., laws, regulations, ordinances) to implement the conservation effort or regulatory program in place?

Legal and Regulatory Compliance
The Forest Service and the Bureau of Land Management plan and manage the National Forests and BLM districts within the range of the northern spotted owl under congressional multiple use and sustained yield mandates. This is an unprecedented ecosystem approach to establishing interagency standards and guidelines to protect the northern spotted owl and other old-growth species including Oregon Coastal coho. Eight federal agencies – Forest Service, Bureau of Land Management, Fish and Wildlife Service, National Marine Fisheries Service, National Park Service, Environmental Protection Agency, National Biological Survey, and Bureau of Indian Affairs -- have cooperated to produce those standards and guidelines.

Northwest Forest Plan Record of Decision
In the 1994 Record of Decision, the Secretary of Agriculture and the Secretary of the Interior, jointly amended the planning documents of nineteen National Forests and seven Bureau of Land Management Districts. This management direction consists of extensive standards and guidelines, including land allocations, which comprise a comprehensive ecosystem management strategy.

The following regulatory mechanisms are in place to implement the NWFP. For a description of each, see Question 3 above.

National Environmental Policy Act (NEPA)

National Forest Management Act (NFMA)

Federal Land Policy and Management Act (FLPMA)

Endangered Species Act (ESA)

Clean Water Act

Protection of Tribal Treaty Rights and Trust Resources

Valid Existing Rights

7. Is there a high level of certainty that the BLM and Forest Service will obtain the funding necessary to implement the conservation effort or regulatory program?

There is a high level of certainty that the BLM and Forest Service will obtain the funding necessary in the foreseeable future to implement the Northwest Forest Plan. Federal funding of the Northwest Forest Plan has remained constant or decreased slightly on a year to year basis since it was created 10 years ago. Refer to question 1.

The Riparian Reserve system, which will lead to the majority of restoration, requires little or no funding to implement. In other words, the BLM and FS can say that over 22,000 miles of stream, which are being largely managed under a passive restoration program, requires little of no funding to implement.

8. Is an implementation schedule (including incremental completion dates) for the conservation effort established? If so, provide the schedule.

Implementation of the Northwest Forest Plan has been has been ongoing since 1994. It however contains no formal implementation schedule. Components of the Aquatic Conservation Strategy are completed as funding and capabilities permit. Since 1994, 100% of the Riparian Reserves and Tier 1 Key Watersheds have been identified in the NWFP area. Watershed analysis has been completed on 97.5% of the Northwest Forest Plan area. Watershed restoration initially was focused on reducing sediment delivery from roads to aquatic systems and silvicultural treatments in riparian reserves to restore large conifer canopies. Restoration of in-stream habitat complexity is ongoing and is being accomplished using active and passive techniques.

Table 2 – ACS Implementation within the OC Coho ESU shows the percentage of each ACS component completed by FS and BLM administrative units in the OC Coho ESU area.

Table 2 – ACS Implementation within the OC Coho ESU

Administrative Unit	*Riparian Reserves Identified (%)*	*Tier 1 Key Watersheds Identified (%)*	*Completed Watershed Analysis (%)*	*Watershed Restoration*
Siskiyou	100	100	99.9	ongoing
Siuslaw	100	100	98	ongoing
Umpqua	100	100	98.5	ongoing
Coos Bay	100	100	93.1	ongoing
Eugene	100	100	96.1	ongoing
Roseburg	100	100	100	ongoing
Salem	100	100	97.1	ongoing
All Units	**100**	**100**	**97.5**	**ongoing**

Regarding the incremental completion dates for meeting ACS objectives, the Northwest Forest Plan Record of Decision states:

> "…it may take decades, possibly more than a century, to accomplish all of [the ACS] objectives. Some improvements in aquatic ecosystems, however, can be expected in 10 to 20 years."

The 22,663 miles of stream buffered with riparian reserves on BLM and FS-administered lands, is under going passive restoration. Consequently, it is a reasonable to expect that at least 10 to 20 years will be required for many of the riparian areas within the reserve system to fully recover from past management actions. However, the active restoration associated with the Watershed Restoration program provides more immediate benefits to fisheries resources.

The certainty that the conservation effort will be effective

1. Describe the nature and extent of threats (factors for decline) being addressed by the conservation effort or regulatory program and explain how the conservation effort or regulatory program reduces the threats.

The Oregon Department of Fish and Wildlife factors of decline for the Oregon Coastal coho that pertain to the Northwest Forest Plan include physical habitat, water quality and water quantity. The FS and BLM have been active in implementing restoration projects since initiation of the NWFP in 1994 and before, addressing the following ODFW Factors for Decline: channel morphology, in-stream roughness, lack of spawning gravel, passage impediments, riparian condition, excessive fine sediment, altered stream flows, and wetland abundance and condition. Since 1998, the FS and BLM have spent over $20 million on aquatic habitat improvement in the OC Coho ESU. Restoration accomplishments by the FS and BLM administrative units in the OC Coho ESU are summarized for the time period 1998-2003 in Table 3.

Table 3. Watershed restoration accomplishments in the OC Coho ESU for the time period 1998-2003 by all BLM and FS administrative units.

Monitoring Unit	*Instream Structures (mi.)*	*Number of Instream Projects*	*Instream Passage (mi.)*	*Number of Stream Crossing Improvements*	*Riparian (mi.)*	*Decommissioned Roads (mi)*	*Road Improved (mi.)*	*Wetland Fresh (ac.)*
North Coast	76.8 (6.8)	3	1.25	1	24.7	16.7	53.16	0
Mid Coast	49.46	82	21.26	38	22.30	89.33	72.64	0
Mid South Coast	32	85	24.8	23	4.7	31.4	35.4	10.5
Umpqua	73.28	80	115.2	81	2.6	137.06	234.36	0
Totals	**231.54**	**250**	**162.51**	**143**	**54.3**	**274.49**	**395.56**	**10.5**

Definitions:
Instream Structure: Miles of stream treated to the nearest tenth of a mile. Includes actions designed to change or modify stream complexity and structure, including but not limited to placement of large woody debris, construction of weirs/deflectors, creation of pools, placement of boulders, rock gabions, gravel placement, development or improvement of side channels, alcoves, or other actions designed to improve stream structure.
Number of Instream Projects: The number of instream habitat improvement projects that were completed.
Instream Passage: Miles of stream accessed to the nearest tenth of a mile. Includes actions designed to protect and improve fish passage for juvenile or adult fish including but not limited to: culvert removal, culvert upgrade, fish ladders improved or installed, irrigation diversions, fish screens.
Number of Stream Crossing Improvements: The number of culvert or ford replacements or modifications completed to improve fish passage.
Riparian miles: Miles of stream within the treated area to the nearest tenth of a mile. Includes actions designed to improve, restore, or maintain quality and/or conditions of riparian zone vegetation; including but not limited to planting, fencing, off channel watering, beaver management, invasive plant control, livestock rotation or other management, stand conversion.
Roads decommissioned: Miles of roads decommissioned to the nearest tenth of a mile. Includes actions designed to make roads hydrologically stable and self-maintaining. Actions may range from full obliteration to water barring along with culvert removal.
Roads improved: Miles treated to the nearest tenth of a mile. Includes actions/activities designed to reduce sediment and improve stability or to allow more natural functioning of stream and flood plain - including but not limited to drainage, upgrades, stabilization, and relocation.
***Wetlands (Freshwater)*:** Acres treated to the nearest acre. Activities designed to create, maintain, or restore freshwater wetland habitat.

Following 3 years of NWFP implementation, NOAA Fisheries subsequently reviewed the adequacy of 14 individual LRMPs, as modified by the NWFP and its ACS, for conserving Oregon Coast and Southern Oregon/ Northern California Coast coho salmon. The results of these reviews are described in two conference opinions (NMFS, 1995 and 1997d) that document NMFS' determinations that the programmatic direction for Federal land management actions embodied in the 14 LRMPs would not be likely to jeopardize the continued existence of OC coho salmon. Moreover, the opinions concluded that implementation of management direction in the LRMPs and RMPs will result in substantially improved habitat conditions for these ESUs over the next few decades and into the future. Improved habitat

conditions will result in increased survival of the freshwater life stages of these fish. Implementation of actions consistent with the ACS objectives and components—including watershed analysis, watershed restoration, reserve and refugia land allocations, and associated standards and guidelines—will provide high levels of aquatic ecosystem understanding, protection, and restoration for aquatic habitat dependent species.

2. Describe explicit incremental objectives for the conservation effort or regulatory program and dates for achieving them.

The most significant element of the NWFP for anadromous fish is it's Aquatic Conservation Strategy (ACS), a regional scale aquatic ecosystem conservation strategy that includes: (1) Special land allocations, such as key watersheds, riparian reserves, and late-successional reserves, to provide aquatic habitat refugia; 2) special requirements for project planning and design in the form of standards and guidelines; and (3) new watershed analysis, watershed restoration, and monitoring processes. These ACS components collectively ensure that Federal land management actions achieve a set of nine Aquatic Conservation Strategy objectives, which include salmon habitat conservation. In recognition of over 300 ''at-risk'' Pacific salmonid stocks within the NFP area (Nehlsen et al., 1991), the ACS was developed by aquatic scientists, with NMFS participation, to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands. The ACS strives to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and to restore currently degraded habitats. The approach seeks to prevent further degradation and to restore habitat on Federal lands over broad landscapes.

All site level projects have and will continue to meet the protective measures in the ACS standards and guidelines such as riparian buffer widths. The FS and BLM continue to seek attainment of ACS objectives at the watershed and landscape scales. The agencies are actively monitoring watersheds over time to assure the Northwest Forest Plan is attaining the ACS objectives.

Time-Frame for Achieving ACS Objectives
Language on page B-9 of the Northwest Forest Plan Record of Decision states:

> "…it may take decades, possibly more than a century, to accomplish all of [the ACS] objectives. Some improvements in aquatic ecosystems, however, can be expected in 10 to 20 years."

Requiring projects to achieve ACS objectives in a certain time frame could establish an unreasonable standard. For instance, restoration of some components of old-growth forest habitats is likely to take more than a decade to accomplish.

3. Describe the steps necessary to implement the conservation effort.

There is no implementation schedule for the NWFP ACS. ACS objectives are attained as capabilities permit. Descriptions of the ACS objectives and it's four components—riparian reserves, key watersheds, watershed analysis, watershed restoration—followed by a description of their application within the Oregon Coastal coho ESU and the ways such applications address ODFW Factors for Decline and IMST reports is provided in the main BLM/FS assessment report.

4. Describe quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured.

The agencies have developed a monitoring plan to assess progress toward attainment of ACS objectives across the Northwest Forest Plan area. The Aquatic Riparian Effectiveness Monitoring Plan (AREMP) was approved in March 2001 and published in 2004 (Reeves et al. 2004). Under the AREMP, the condition of various watersheds across the Northwest Forest Plan area will be evaluated. Over time, AREMP will show whether watershed conditions are improving.. Specific parameters measured during the AREMP process to assess watershed condition include the following:

- Channel condition – channel gradient, bankfull width, pools, channel substrate, large wood
- Riparian Condition – riparian vegetation and roads
- Upland Conditions – upland vegetation and roads

5. Describe provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort or regulatory program.

Monitoring and evaluation occurs as part of every Resource Management Plan. Many project-level decisions also include monitoring and adaptive management plans. Each National Forest and BLM District publishes monitoring results relevant to implementation of their respective Resource Management Plans. Project plans include monitoring to ensure they are implemented as planned.

The Northwest Forest Plan Record of Decision provides for a monitoring plan. This plan has been implemented, and since 1996, implementation and effectiveness of the ACS across the Northwest Forest Plan area has been assessed through an Interagency Regional Program. This program conducts broad-scale monitoring on federally managed lands within the Northwest Forest Plan area and represents the combined monitoring efforts of eight federal agencies and partnerships with state agencies and academic institutions.

The 2001 field season marked the sixth consecutive year of the Northwest Forest Plan implementation monitoring program. This program is designed to determine whether the Record of Decision and its corresponding standards and guidelines are consistently followed across the Northwest Forest Plan area. Overall, compliance in meeting the Northwest Forest Plan standards and guidelines was 98 percent for the 21 projects and watersheds monitored in 2001 (USDA/USDI Regional Implementation Monitoring Team 2001).

Detailed implementation monitoring results are available in the Biological Assessment and in individual monitoring reports. Other ongoing efforts to evaluate the effectiveness of the ACS at watershed and broader scales include the Aquatic Riparian Effectiveness Monitoring Plan (AREMP), which was approved in March 2001 and published in 2004 (Reeves et al. 2004). Under the AREMP, the condition of various watersheds across the Northwest Forest Plan area will be evaluated. Over time, AREMP will show whether watershed conditions are improving. The AREMP will provide information in a decade or more at the province scale. Monitoring also occurs as a part of projects and each Resource Management Plan.

6. Describe how principles of adaptive management are incorporated.

The Northwest Forest Plan requires adaptive management. Adaptive management is a continuing process of action-based planning, monitoring, research, evaluation, and adjustment with the objective of improving the implementation and achieving ACS objectives. Under the concept of adaptive management, new information will be evaluated and a decision will be made whether to make adjustments. Agencies will use monitoring results associated with individual unit plans to guide future actions. The watershed analysis process encourages informal updates as new information becomes available. Updated watershed analyses are likely to be an important future source of monitoring information.

Appendix 2 – ODFW Factors for Decline

1. **ODFW Factors of Decline –** In the May 6, 1997 Federal Register, the National Marine Fisheries Service (now known as NOAA Fisheries) listed factors of decline for the Oregon Coast ESU. The ODFW created a Factors of Decline list which includes and expands on those listed by NOAA Fisheries. The ODFW Factors of Decline used in this report include the following:

Table 1 – ODFW Factors of Decline

Factor of Decline Category	**Category Elements**
Physical Habitat	aquatic weeds, channel morphology, estuarine habitat condition, excessive fine sediment, instream roughness, lack of spawning gravel, passage impediments, riparian condition, wetland abundance and condition
Water Quality	bacteria, dissolved oxygen, excessive nutrients, inadequate nutrients, pH, temperature, toxic substances, water quality index
Water Quantity	altered streamflows, insufficient streamflows
Direct take of Salmonids	bycatch, commercial harvest, illegal take (poaching), mortality associated with activities in the active stream channel, mortality due to dams and diversions, recreational harvest, scientific and educational take
Hatchery Management	change in run timing, competition with hatchery reared fish, disease, increased predation of wild fish due to large numbers of hatchery fish attracting predators, loss of genetic adaptation of wild populations from interbreeding with genetically dissimilar and less fit hatchery fish
Biological Condition	beaver management, disease, index of macroinvertebrates biotic integrity, index of invertebrate biotic integrity, interactions with exotic fishes, predation by pinnipeds and sea birds
Climate Cycles/Change	global warming, natural ocean productivity & climate cycles
Other Fish Issues	depletion of wild stocks, difficulty in counting wild stocks, low density reproductive failure

Appendix 3 – Standards and Guidelines as Applied to ACS Riparian Reserves

Standards and Guidelines as Applied to ACS Riparian Reserves: As a general rule, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives. Watershed analysis and appropriate NEPA compliance is required to change Riparian Reserve boundaries in all watersheds.

Timber Management

TM-1. Prohibit timber harvest, including fuel wood cutting, in Riparian Reserves, except as described below. Riparian Reserve acres shall not be included in calculations of the timber base.

a. Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuel wood cutting if required to attain Aquatic Conservation Strategy objectives.

b. Salvage trees only when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected.

c. Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

Roads Management

RF-1. Federal, state, and county agencies should cooperate to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.

RF-2. For each existing or planned road, meet Aquatic Conservation Strategy objectives by:

a. minimizing road and landing locations in Riparian Reserves.

b. completing watershed analyses (including appropriate geotechnical analyses) prior to construction of new roads or landings in Riparian Reserves.

c. preparing road design criteria, elements, and standards that govern construction and reconstruction.

d. preparing operation and maintenance criteria that govern road operation, maintenance, and management.

e. minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.

f. restricting side casting as necessary to prevent the introduction of sediment to streams.

g. avoiding wetlands entirely when constructing new roads.

RF-3. Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by:

a. reconstructing roads and associated drainage features that pose a substantial risk.

b. prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.

c. closing and stabilizing, or obliterating and stabilizing roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.

RF-4. New culverts, bridges and other stream crossings shall be constructed, and existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions will be improved, to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

RF-5. Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.
RF-6. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.
RF-7. Develop and implement a Road Management Plan or a Transportation Management Plan that will meet the Aquatic Conservation Strategy objectives. As a minimum, this plan shall include provisions for the following activities:
a. inspections and maintenance during storm events.
b. inspections and maintenance after storm events.
c. road operation and maintenance, giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources.
d. traffic regulation during wet periods to prevent damage to riparian resources.
e. establish the purpose of each road by developing the Road Management Objective.

Grazing Management
GM-1. Adjust grazing practices to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives. If adjusting practices is not effective, eliminate grazing.
GM-2. Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside the Riparian Reserve, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.
GM-3. Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.

Recreation Management
RM-1. New recreational facilities within Riparian Reserves, including trails and dispersed sites, should be designed to not prevent meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impact to ensure that these do not prevent, and to the extent practicable contribute to, attainment of Aquatic Conservation Strategy objectives.
RM-2. Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.
RM-3. Wild and Scenic Rivers and Wilderness management plans will address attainment of Aquatic Conservation Strategy objectives.

Minerals Management
MM-1. Require a reclamation plan, approved Plan of Operations, and reclamation bond for all minerals operations that include Riparian Reserves. Such plans and bonds must address the costs of removing facilities, equipment, and materials; recontouring disturbed areas to near pre-mining topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvage and replacement of topsoil; and seedbed preparation and revegetation to meet Aquatic Conservation Strategy objectives.
MM-2. Locate structures, support facilities, and roads outside Riparian Reserves. Where no alternative to siting facilities in Riparian Reserves exists, locate them in a way compatible with Aquatic Conservation Strategy objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Such roads will be constructed and maintained to meet roads management

standards and to minimize damage to resources in the Riparian Reserve. When a road is no longer required for mineral or land management activities, it will be closed, obliterated, and stabilized.
MM-3. Prohibit solid and sanitary waste facilities in Riparian Reserves. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in Riparian Reserves exists, and releases can be prevented, and stability can be ensured, then:
a. analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.
b. locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in Riparian Reserves.
c. monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.
d. reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.
e. require reclamation bonds adequate to ensure long-term chemical and physical stability of mine waste facilities.
MM-4. For leasable minerals, prohibit surface occupancy within Riparian Reserves for oil, gas, and geothermal exploration and development activities where leases do not already exist. Where possible, adjust the operating plans of existing contracts to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives.
MM-5. Salable mineral activities such as sand and gravel mining and extraction within Riparian Reserves will occur only if Aquatic Conservation Strategy objectives can be met.
MM-6. Include inspection and monitoring requirements in mineral plans, leases or permits. Evaluate the results of inspection and monitoring to effect the modification of mineral plans, leases and permits as needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.

Fire/Fuels Management
FM-1. Design fuel treatment and fire suppression strategies, practices, and activities to meet Aquatic Conservation Strategy objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuels management activities could be damaging to long-term ecosystem function.
FM-2. Locate incident bases, camps, helibases, staging areas, helispots and other centers for incident activities outside Riparian Reserves. If the only suitable location for such activities is within the Riparian Reserve, an exemption may be granted following review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Use an interdisciplinary team to predetermine suitable incident base and helibase locations.
FM-3. Minimize delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following review and recommendation by a resource advisor, when an escape would cause more long-term damage.
FM-4. Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy objectives.
FM-5. Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy objectives whenever Riparian Reserves are significantly damaged by wildfire or a prescribed fire burning outside prescribed parameters. Other - In Riparian Reserves, the goal of wildfire suppression is to limit the size of all fires. When watershed and/or landscape analysis, or province-level plans are completed and approved, some natural fires may be allowed to burn under prescribed conditions. Rapidly extinguishing smoldering coarse woody debris and duff should be

considered to preserve these ecosystem elements. In Riparian Reserves, water drafting sites should be located and managed to minimize adverse effects on riparian habitat and water quality, as consistent with Aquatic Conservation Strategy objectives.

Lands

LH-1. Identify in-stream flows needed to maintain riparian resources, channel conditions, and fish passage.

LH-2. Tier 1 Key Watersheds: For hydroelectric and other surface water development proposals, require in-stream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. During relicensing of hydroelectric projects, provide written and timely license conditions to the Federal Energy Regulatory Commission (FERC) that require flows and habitat conditions that maintain or restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate state agencies. For all other watersheds: For hydroelectric and other surface water development proposals, give priority emphasis to in-stream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. During relicensing of hydroelectric projects, provide written and timely license conditions to FERC that emphasize in-stream flows and habitat conditions that maintain or restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate state agencies.

LH-3. Locate new support facilities outside Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management, provide recommendations to FERC that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, provide recommendations to FERC that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves will be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.

LH-4. For activities other than surface water developments, issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Adjust existing leases, permits, rights-of-way, and easements to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective, eliminate the activity. Priority for modifying existing leases, permits, rights-of-way and easements will be based on the actual or potential impact and the ecological value of the riparian resources affected.

LH-5. Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction.

General Riparian Area Management

RA-1. Identify and attempt to secure in-stream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

RA-2. Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet coarse woody debris objectives.

RA-3. Herbicides, insecticides, and other toxicants, and other chemicals shall be applied only in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.

RA-4. Locate water drafting sites to minimize adverse effects on stream channel stability, sedimentation, and in-stream flows needed to maintain riparian resources, channel conditions, and fish habitat.

Watershed and Habitat Restoration

WR-1. Design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and attains Aquatic Conservation Strategy objectives.

WR-2. Cooperate with federal, state, local, and tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.

WR-3. Do not use mitigation or planned restoration as a substitute for preventing habitat degradation.

Fish and Wildlife Management

FW-1. Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.

FW-2. Design, construct and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish and wildlife interpretative and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.

FW-3. Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.

FW-4. Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest and poaching that threaten the continued existence and distribution of native fish stocks occurring on federal lands.

Research

RS-1. A variety of research activities may be ongoing and proposed in Key Watersheds and Riparian Reserves. These activities must be analyzed to ensure that significant risk to the watershed values does not exist. If significant risk is present and cannot be mitigated, study sites must be relocated. Some activities not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of these standards and guidelines; will produce results important for establishing or accelerating vegetation and structural characteristics for maintaining or restoring aquatic and riparian ecosystems; or the activities represent continuation of long-term research. These activities should be considered only if there are no equivalent opportunities outside of Key Watersheds and Riparian Reserves.

RS-2. Current, funded, agency-approved research, which meets the above criteria, is assumed to continue if analysis ensures that a significant risk to Aquatic Conservation Strategy objectives does not exist. Research Stations and other Forest Service and BLM units will, within 180 days of the signing of the Record of Decision adopting these standards and guidelines, submit a brief project summary to the Regional Ecosystem Office of ongoing research projects that are potentially inconsistent with other standards and guidelines but are expected to continue under the above research exception. The Regional Ecosystem Office may choose to more formally review specific projects, and may recommend to the Regional Interagency Executive Committee modification, up to and including cancellation, of those projects having an unacceptable risk to Key Watersheds and Riparian Reserves. Risk will be considered within the context of the Aquatic Conservation Strategy objectives.