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United States
Department of
Agriculture

Forest Service

United States
Department of
Interior

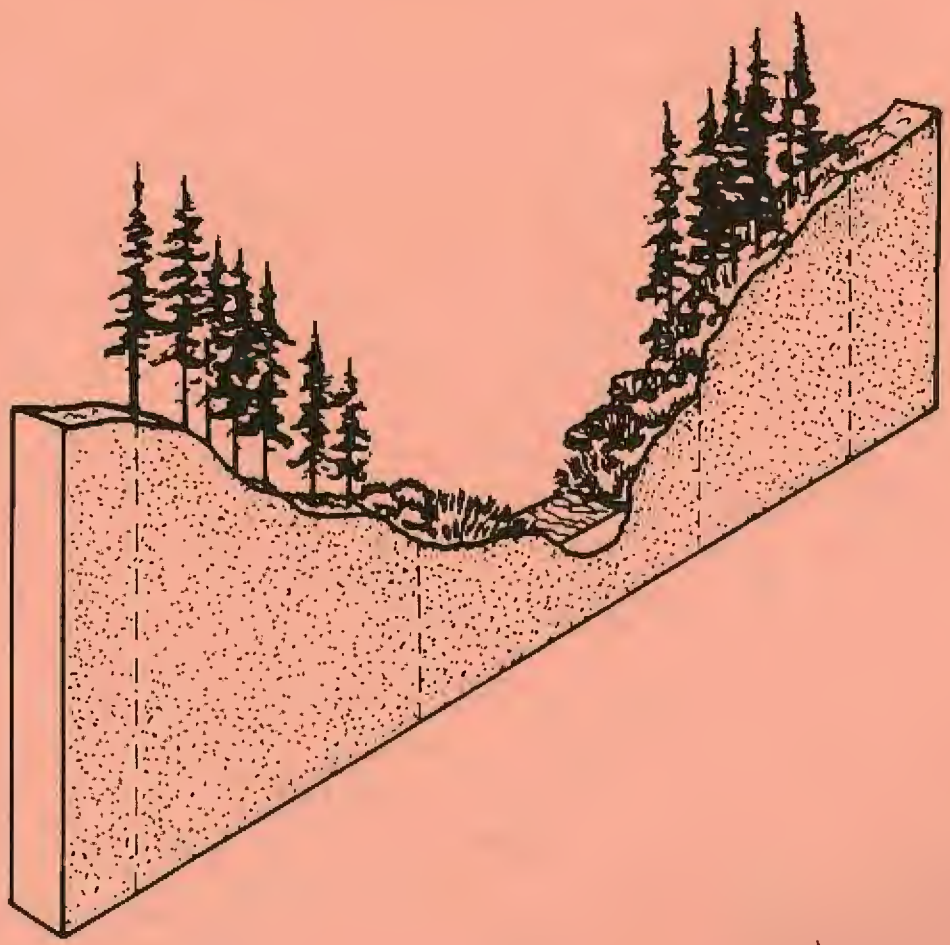
Bureau of Land
Management

Environmental Assessment

for the

Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California

March 1994



ABBREVIATIONS AND ACRONYMS

AFS	American Fisheries Society
AUM	Animal Unit Month
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulation
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEMAT	Forest Ecosystem Management Team
FLPMA	Federal Land Policy and Management Act
FS	Forest Service
FSEIS	Final Supplemental Environmental Impact Statement
FY	Fiscal Year
ID Team	Interdisciplinary Team
LUP	Land Use Plan
MMBF	Millions of Board-feet
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NMFS	National Marine Fisheries Service
R5	Forest Service Region 5 - California Region
RHCA	Riparian Habitat Conservation Area
RMO	Riparian Management Objective
RPA	Resources Program and Assessment
RVD	Recreation Visitor-Day
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service

U.S. Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

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Forest Service
Washington, D.C. 20090

Date: March 18, 1994

Dear Reader:

The USDA Forest Service and the USDI Bureau of Land Management (BLM) are pleased to provide you with the enclosed environmental assessment (EA). This document evaluates a range of ecosystem-based interim management strategies that are designed to arrest the degradation and begin the restoration of aquatic habitat and riparian areas on the lands administered by the Forest Service and BLM in Oregon, Idaho, Washington, and California. Specifically, it applies to watersheds outside the range of the northern spotted owl that provide habitat for Pacific salmon, steelhead, and sea-run cutthroat trout (anadromous fish).

New information has documented broad declines in anadromous fish as a result of dam construction and operation, water diversions, fish hatchery operations, fish harvest, and the widespread degradation of the habitats upon which these species depend. The importance of each of these factors to the decline of anadromous fish varies by species and geographic area. However, the degradation of freshwater habitat is a common causal factor affecting all at-risk stocks--and has prompted us to develop a comprehensive and coordinated strategy (commonly referred to as PACFISH) for restoring and protecting habitat of the affected species. Our intent is to work with reviewers like you in developing a strategy that will restore ecological health to and the productivity of watersheds that contain present or potential habitat for anadromous fish. Longer-term application of management strategies is being examined in several geographically specific environmental impact statements (EISs).

We want to ensure that nothing done by the agencies while the EISs are being prepared would lead to the extinction or further endangerment of at-risk anadromous fish stocks or otherwise limit options that will be explored in the EISs. For that reason, we are evaluating a range of interim strategies that could be followed for 18 months, or until the EISs are completed.

We would appreciate your careful review of this document, and also your comments on what we are proposing. To be considered during the formulation of our final decision, your comments should be postmarked no later than 45 days after the Notice of Availability is

published in the Federal Register. Please send your comments to: "PACFISH EA, U.S. Department of Agriculture Forest Service, Post Office Box 96090, Washington, D.C., 20090-6090.

We are enclosing a copy of the proposed Finding of No Significant Impact (FONSI). The proposed FONSI documents why we believe the preferred alternative would not cause significant impacts (as defined by the National Environmental Policy Act of 1969). Similarly, we do not believe the preferred alternative would constitute significant amendment (as defined by the National Forest Management Act of 1976) of current forest plans. We would appreciate your review of and comment on the proposed FONSI.

For your additional information, we are enclosing a copy of the "Biological Evaluation" and the "Biological Assessment." For each of the alternatives considered in detail, the Biological Evaluation describes the expected effects on species listed under the Endangered Species Act as threatened or endangered, or which are identified by the agencies as sensitive. The Biological Assessment analyzes the potential effects on threatened and endangered species and/or designated critical habitat, but only for the preferred alternative

Thank you for your continued interest. We look forward to hearing from you.

Sincerely,

JACK WARD THOMAS
Chief
USDA Forest Service

MIKE DOMBECK
Acting Director
USDI Bureau of Land Management

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U.S.D.A. Forest Service and U.S.D.I. Bureau of Land Management

PURPOSE OF AND NEED FOR ACTION

Background

The U.S.D.A. Forest Service (FS) and the U.S.D.I. Bureau of Land Management (BLM) [hereinafter jointly referred to as "the Agencies"] are developing an ecosystem-based, aquatic habitat and riparian-area management strategy (commonly referred to as PACFISH), for Pacific salmon, steelhead, and sea-run cutthroat trout habitat on lands they administer. The strategy is being developed in response to new information documenting broad declines in naturally reproducing Pacific salmon, steelhead, and sea-run cutthroat trout [hereinafter referred to as anadromous fish], and widespread degradation of the habitat upon which these anadromous fish depend.[1] This environmental assessment analyzes a range of interim strategies for arresting the degradation and beginning the restoration of aquatic and riparian ecosystems during the next 18 months while a longer-term strategy is developed and evaluated. Recent studies warrant consideration of an interim strategy for management of aquatic and riparian ecosystems on lands administered by the Agencies.

In March-April 1991, the American Fisheries Society (AFS), a professional society of fisheries research scientists and fisheries managers, published a report[2] that identified 214 stocks of naturally reproducing anadromous fish in California, Oregon, Washington, and Idaho, that were considered to be "at risk" of extinction or "of special concern." The report also documented 106 additional stocks that already are extinct. The depressed status of 214 stocks reflects the interaction of inherently variable environmental conditions, such as ocean productivity and weather patterns, with a variety of management activities. In general, stock survival is threatened by some combination of dam construction and operation, water diversions, habitat modifications, fish hatchery operations, and fish harvest. Reasons for the decline of anadromous fish vary by species and geographic area (e.g., dams are a primary factor affecting the status of some stocks, but have a negligible effect on others), however, degradation of freshwater habitat is a common feature affecting all at-risk stocks. A 1992 report[3] calculated that of the 192 stocks of anadromous fish in the Columbia River Basin, 35 percent are extinct, 19 percent were at high risk of extinction, 7 percent were at moderate risk of extinction, 13 percent were of special concern, and 26 percent were presumed secure.

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[1]USDA Forest Service Pacific Salmon Work Group and Field Team. 1992. *Informational Report - Background Report for the Development of the Forest Service Management Strategy for Pacific Salmon and Steelhead Habitat.*

[2]W. Nehlsen, J. E. Williams, and J. A. Lichatowich. 1991. *Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington.* Fisheries 16 (2): 4-21.

[3]J.E. Williams, J.A. Lichatowich, and W. Nehlsen. 1992. *Declining Salmon and Steelhead Populations: New Endangered Species Concerns for the West.* Endangered Species Update. 9(4):1-8.

Subsequent surveys in California[4], Oregon[5], and Washington[6] confirmed the scope but broadened the magnitude of the decline.

Assessments by researchers indicate that stream systems throughout California, Oregon, Washington, and Idaho, have been degraded considerably by human-induced cumulative effects from such activities as livestock use, road construction, timber harvest, recreational use, channelization, and other watershed management projects and activities. For example, from 1987 to 1992, researchers from the Pacific Northwest Research Forest and Range Experiment Station resurveyed 116 stream systems in Oregon, Washington, and Idaho, and compared the number of large, deep pools per stream mile--a primary indicator of high quality, in-channel habitat condition, to the number documented during surveys conducted between 1935 and 1945. Their report[7] documents substantial decreases in the quality and quantity of large, deep pools throughout managed areas of the region. The number of large, deep pools decreased 58 percent in the Cowlitz River Basin, 41 percent in the Lewis River, 84 percent in the Elochoman River Basin, and 85 percent in the Yakama River Basin, all in Washington State; 78 percent in the Lewis and Clark River and 85 percent in the Clatskanie River, both in Oregon; and 52 percent in the Salmon River Basin of Idaho. Pool-riffle ratios have decreased from historic levels of about 50:50 to 20:80 or 10:90 according to Oregon Game Commission surveys in the 1960s and Forest Service surveys in the 1970s (unpublished data).

Despite implementation of gradually improving best management practices through national forest Land and Resource Management Plans (forest plans) and BLM Land Use Plans (LUPs), riparian and aquatic habitat conditions on Federal lands have continued to decline. Generally, anadromous fish habitat on lands administered by the Agencies have 30-70 percent fewer large, deep pools, more fine sediments in spawning gravels, and greater disturbance of riparian vegetation than is acceptable. Such factors reflect a general reduction in fish habitat capability.[8] Many streams have become simplified, having lost the structural complexity vital to the productivity and well-being of many aquatic species.

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[4]P. Higgins, S. Dobush, and D. Fuller. 1992. *Factors in Northern California Threatening Stocks with Extinction.* American Fisheries Society, Humboldt Chapter. 25 pp.

[5]T.E. Nickelson, J.W. Nicholas, A.M. McGie, R.B. Lindsay, D.L. Bottom, R.J. Kaiser, and S.E. Jacobs. 1992. *Status of Anadromous Salmonids in Oregon Coastal Basins.* Oregon Dept. of Fish and Wild., Portland. 83 pp.

[6]Washington Department of Fisheries, Washington Department of Wildlife, and Western Washington Treaty Indian Tribes. 1993. *Washington State Salmon and Steelhead Stock Inventory.* Washington Dept. of Fisheries., Olympia. 212 pp.

[7]J.R. Sedell and F.H. Everest, 1991. *Historic Changes in Pool Habitat for Columbia River Basin Salmon Under Study for Listing.* U.S. Dept. Agric. For. Serv. Pac. Northwest Res. Stn., Corvallis, Oregon.

[8]Naiman, R.J., T.J. Beechie, L.E. Benda, et al. 1992. *Fundamental Elements of Ecologically Healthy Watersheds in the Pacific Northwest Coastal Ecoregion.* Pp. 127-188. In: Naiman, R.J. ed. *Watershed Management: Balancing Sustainability and Environmental Change.* New York, NY. Springer-Verlag. Bisson, P.A., T.P. Quinn, G.H. Reeves, and S.V. Gregory. 1992. *Best Management Practices, Cumulative Effects, and Long-term Trends in Fish Abundance in Pacific Northwest River Systems.* Pp. 189-232. In: Naiman, R.J. ed. *Watershed Management: Balancing Sustainability and Environmental Change.* New York, NY. Springer-Verlag.

Agency-administered lands provide substantial habitat for remaining stocks of anadromous fish. The Agencies estimate that of the 214 stocks identified in the AFS published report as at risk of extinction, 134 occur on FS-administered lands and 109 on BLM-administered lands.[9] The National Marine Fisheries Service (NMFS) has determined that the Snake River sockeye salmon is endangered,[10] and the Snake River fall and spring/summer chinook salmon is threatened[11] pursuant to provisions of the Endangered Species Act of 1973, as amended (ESA). The Sacramento River winter chinook salmon was listed as threatened[12] in 1990. The NMFS recently determined that reclassifying the Sacramento River winter chinook salmon as endangered was warranted.[13] Additional stocks have been, or are expected to be, petitioned for listing.[14] Further, all anadromous fish in the Snake River Basin have been designated as sensitive species by the FS and are being considered for such designation by the BLM.

The Agencies have taken a number of independent actions to respond to declines in anadromous fish stocks and the degradation of habitat. Both participated in the 1990-1991 "Salmon Summit," which was convened by Senator Mark Hatfield to examine restoration of Columbia River Basin anadromous fish. The Agencies were instrumental in developing the Habitat Section of the Summit Report,[15] and have undertaken a number of the near-term actions identified in that report. They have developed and are implementing a variety of anadromous fish program initiatives[16] for management of their respective anadromous fish habitat resources. To date, however, even in light of ongoing efforts, neither Agency has implemented a comprehensive approach to ecosystem-based management of aquatic and riparian habitats. In addition, as required by the ESA, projects and activities on 10 national forests and 4 BLM districts are subject to consultation with the NMFS on threatened and endangered anadromous fish in the Snake River Basin. During consultation the Agencies have found that adoption of habitat protection standards similar to those explored in this

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[9] J.E. Williams and C. D. Williams. ms. *An Ecosystem-based Approach to Management of Salmon and Steelhead Habitat.* Ms. prepared for Pacific Salmon and their Ecosystems Conference. Seattle, WA. Jan 1994.

[10] NMFS determination in 56 FR 58619; November 20, 1991. Added to list in 57 FR 212; January 3, 1992. Critical Habitat designated in 58 FR 68543; December 28, 1993.

[11] NMFS determination in 57 FR 14654; April 22, 1992 [Corrected in 57 FR 23458; June 3, 1992]. Added to list in 58 FR 49880; September 23, 1993. Critical Habitat designated in 58 FR 68543; December 28, 1993.

[12] NMFS determination in 55 FR 46515; November 5, 1990. Added to list in 55 FR 49623; November 30, 1990. Critical Habitat designated in 58 FR 33212; June 16, 1993.

[13] NMFS determination in 59 FR 440; January 4, 1994.

[14] In particular, the Illinois River winter steelhead in Oregon, other coastal and interior steelhead, the mid-Columbia River chinook, and the coho (silver) salmon throughout their range in the lower 48 states.

[15] *Report of the Salmon Summit.* 1991. Submitted by Governors Roberts (OR), Gardner (WA), Andrus (ID), and Stephens (MT) to Senator Hatfield (OR).

[16] USDI Bureau of Land Management. 1993. *Anadromous Fish Habitat Management and Funding Strategy for the Columbia and Snake River Basins.* USDA Forest Service, Regions 1, 4, and 6. 1991. *Columbia River Basin Anadromous Fish Habitat Management Policy and Implementation Guide.*

environmental assessment generally has become the accepted method of meeting threatened and endangered anadromous fish habitat requirements.

On January 25, 1994, the Agencies joined with the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), and the NMFS in signing an Interagency Memorandum of Understanding (Interagency MOU) to cooperate in management of federally administered lands for the conservation of species that are tending towards Federal listing as threatened or endangered pursuant to the ESA. The Interagency MOU describes the protection and proper management of habitats as an important tool for preventing additional listings of species. The Interagency MOU was executed to facilitate compliance with ESA Section 7(a) obligations requiring all Federal agencies to proactively manage lands and resources within their jurisdictions for the conservation of rare species.

The strategy being developed by the Agencies would provide a consistent approach for maintaining and restoring aquatic and riparian habitat conditions, and would contribute to the sustained natural production of anadromous fish. The Agencies established two technical teams--the FS/BLM Field Team and Washington Office Work Group--and one Washington Office Policy Group, to coordinate strategy development. All three were composed of Agency research scientists and managers. The information developed by these groups provided the foundation for the aquatic and riparian components of the Scientific Analysis Team Report[17] and the Forest Ecosystem Management Assessment Team (FEMAT) Report.[18] Measures for maintaining and restoring anadromous fish habitat are included in the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* [hereinafter referred to as the "Northern Spotted Owl FSEIS"] for all or parts of the 15 national forests and 6 BLM Districts[19] that are within the range of the northern spotted owl, and which accommodate naturally reproducing stocks of anadromous fish.

Over the next 18 months, the Agencies will cooperatively prepare several geographically specific environmental impact statements (EISs) to examine longer-term management strategies for protecting or restoring anadromous fish-producing watersheds in areas considered in this environmental assessment. The EIS for eastern Oregon and Washington

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[17]J.W. Thomas, M.G. Raphael, R.G. Anthony, E.D. Forsman, A.G. Gunderson, R.S. Holthausen, B.G. Marcot, G.H. Reeves, J.R. Sedell, and D.M. Solis. March 1993. *Viability Assessments and Management Considerations for Species Associated with Late-Successional and Old-Growth Forests of the Pacific Northwest - The Report of the Scientific Analysis Team*. USDA, Forest Service. Portland, Oregon.

[18]Forest Ecosystem Management Assessment Team. 1993. *Forest Ecosystem Management: an Ecological, Economic, and Social Assessment*, USDA, Forest Service. Portland, Oregon.

[19]The Mt. Hood, Rogue River, Siskiyou, Siuslaw, Umpqua, Willamette, Gifford-Pinchot, Mt. Baker-Snoqualmie, a portion of the Okanogan, Olympic, Wenatchee, Klamath, Shasta-Trinity, Mendicino, and Six Rivers National Forests; and the Coos Bay, Medford, Eugene, Roseburg, and Salem BLM Districts in Oregon; and the Arcata and Redding Resource Areas of the Ukiah BLM District in California.

already has been initiated.[20] Notices of Intent are in preparation for the remaining areas. The geographically specific EISs will build on the information developed by the Agencies' technical teams and policy group, and determine if amendments to forest plans, LUPs, or regional guides in California, Idaho, Oregon, and Washington, are necessary.

Because new information documents that nearly one-half of the anadromous fish stocks are at risk of extinction, and habitat degradation is a common causal factor, the Agencies are analyzing a range of interim strategies, based on the work of the technical teams and policy group, for immediately arresting the decline in habitat conditions and protecting remaining high quality habitat until the geographically specific EISs are completed. The Agencies want to ensure that nothing done on national forests and BLM public lands in the interim results in the extinction or further endangerment of at-risk anadromous fish stocks, or otherwise precludes options that will be considered in the geographically specific EISs. Improved management of aquatic and riparian ecosystems on lands administered by the Agencies, combined with improvements in hydropower operations, hatchery practices, and fish harvest management, can prevent additional stocks from becoming extinct and preclude the need to extend the protections of the Endangered Species Act to other at-risk anadromous fish stocks in California, Idaho, Oregon, and Washington.

In accordance with congressional direction provided in the fiscal year 1994 Interior and Related Agencies Appropriations Act, the FS will not implement new anadromous fish habitat management direction during fiscal year 1994 on the Tongass National Forest in Alaska, but will conduct studies and monitor current management practices on the Tongass. In subsequent years, as determined necessary for stewardship of anadromous fish habitat in Alaska and evaluated as required by the National Environmental Policy Act (NEPA), both Agencies will incorporate appropriate measures into forest plans and LUPs for management of all lands and resources within their respective jurisdictions in Alaska.

Although neither Agency has jurisdiction over other factors affecting anadromous fish, each will remain alert for opportunities to coordinate its efforts to improve habitat condition on Agency-administered lands with the efforts taken by others to address such factors as dams, hatcheries, fish harvesting, and private-land habitat condition. Full recovery of listed anadromous fish and conservation of other anadromous fish that are at risk of extinction will depend on the development of a response to all factors affecting their decline, including those factors outside the Agencies' jurisdictions. Regardless of any action or inaction by other responsible agencies or organizations that might affect populations of anadromous fish stocks, the Agencies have responsibilities to proceed with action to restore degraded habitat and protect good-quality habitat.

Purpose

The purpose of this environmental assessment is to provide decisionmakers with analysis of a range of interim strategies for arresting the degradation and beginning the restoration of riparian and aquatic ecosystems in watersheds where anadromous fish habitat is present or easily could be reestablished [hereinafter referred to as anadromous watersheds], to publicly disclose the possible environmental consequences that implementation of each strategy would

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[20]Notice of Intent to prepare an environmental impact statement: *Eastside Ecosystem Management Strategy, Pacific Northwest Region, USDA Forest Service,* USDI Bureau of Land Management, Federal Register February 1, 1994.

bring, and to ensure continuing opportunities to incorporate the latest scientific information into resource plans and management practices. Alternative strategies presented in this environmental assessment are designed to maintain options for more comprehensive mitigation or environmental protection measures that may be found necessary through the geographically specific EISs that will be prepared for the affected area.

To arrest the degradation and begin restoration of anadromous fish habitat, as well as to respond to a wide array of new scientific information on the status of various anadromous fish stocks and the condition of aquatic and riparian habitat, the Agencies are reevaluating all management projects and activities in anadromous watersheds not considered in the Northern Spotted Owl FSEIS. Because the preparation of geographically specific EISs that will examine longer-term options for protecting this habitat is scheduled to take 18 months, and because recent assessments of the short- and long-term risks to maintenance and recovery of anadromous fish stocks under current management direction are high, the Agencies believe that a range of interim strategies must be examined for possible implementation. Such strategies are intended to ensure that management actions taken in the interim do not have adverse environmental effects that could result in extinction or further endangerment of at-risk anadromous fish stocks or otherwise limit the range or number of reasonable alternatives that are to be evaluated in the geographically specific EISs (40 CFR 1506.1).

The FS, in accordance with 36 C.F.R. 219.19, is required to manage habitat to maintain viable populations of anadromous fish and other native and desirable non-native vertebrate species. The BLM, in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA), 43 U.S.C. 1701.8, is required to manage public lands to protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values. Both agencies are required by the Clean Water Act, 33 U.S.C. 1251, 1329, to ensure that activities occurring on lands they administer comply with requirements concerning the discharge or run-off of pollutants. In compliance with their own laws and regulations, and in accordance with the Interagency MOU, the Clean Water Act, and applicable Council on Environmental Quality (CEQ) regulations, the Agencies jointly propose to develop and adopt a coordinated, interim strategy for arresting the degradation and beginning the restoration of aquatic and riparian ecosystems that constitute anadromous fish habitat.

Interim direction also would facilitate the ability of managers of Federal land within the range of listed anadromous fish to make project-specific decisions that will successfully meet requirements of the ESA. Because consultation with the NMFS and the USFWS on the interim direction will be completed prior to any implementation, the interim direction would establish guidance that incorporates during initial project design those measures generally determined necessary for compliance with the ESA. This would result in an approach to project design that is more efficient and cost-effective than awaiting project-specific consultation to incorporate all necessary provisions. Interim direction also would increase Agency consistency with and responsiveness to riparian and aquatic habitat concerns across the range of anadromous fish habitat in the contiguous United States. This, in turn, would reduce the probability that some additional stocks of anadromous fish will need to be listed as threatened or endangered.

There is a noted and continuing decline of habitat elements essential to anadromous fish; and not all forest plans or LUPs include standards, guidelines, and procedures that allow managers to efficiently and effectively address measures suggested by the NMFS for protection of listed anadromous fish species. Further, not all these planning documents ensure the maintenance

and restoration of habitat for other anadromous fish identified as at risk of extinction. To better meet responsibilities to provide habitat for listed and other at-risk anadromous fish stocks, and to avoid gridlock in the management of the national forests and BLM public lands and help stabilize the flow of goods and services from these lands, both Agencies believe there is an immediate need to examine appropriate changes in management direction.

Need

The need for interim management has been made clear by the rapidly declining status of numerous anadromous fish stocks and numerous studies that have demonstrated that declining freshwater habitat condition is a common causal factor in those declines. Furthermore, independent investigations by Agency scientists have confirmed the declining habitat conditions on Agency-administered lands and the dependency of anadromous fish upon high quality habitat conditions.

In 1991, the AFS published the first comprehensive report on the status of anadromous fish stocks.[21] The AFS report documents the results of a 4-year effort by the AFS Endangered Species Committee to gather, interpret, and summarize information compiled from previously published literature and unpublished data on the status of anadromous fish in California, Idaho, Oregon, and Washington. Information contained in that report was gathered from fish management agencies, Native American tribes, Oregon and Idaho chapters of the AFS, and sportfishing and conservation groups as well as from published scientific journals, proceedings, and books. The authors used a wide variety of available data, including spawning escapements, redd counts, adult counts, recreational catch, dam counts, and anecdotal information. The report documented 1 stock that in 1991 already was listed pursuant to the ESA, another 101 stocks at high risk of extinction, 58 at moderate risk of extinction, and 54 of special concern. Thirty-nine of these stocks occur in California, 58 on the Oregon Coast, 76 in the Columbia River Basin, and 41 in the Washington Coast/Puget Sound area. The present or threatened destruction, modification, or curtailment of habitat or range was cited as one of the primary causal factors in the decline of 195 (91 percent) of the at-risk anadromous fish stocks.

Since the AFS Endangered Species Committee report was published, three state-specific reviews of at-risk anadromous fish stocks have been conducted. In northern California, the Humbolt Chapter of the AFS published a report[22] identifying 49 stocks of anadromous fish stocks in streams between the Russian River and the Oregon border. That report generally agreed with the AFS report except that coastal cutthroat were considered by the Humboldt Chapter to be more seriously affected and were reclassified from "of special concern" to "at moderate risk" of extinction, and many of the summer and winter steelhead stocks were subdivided into smaller stock units.

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[21]Report by W. Nehlsen, J.E. Williams, and J.A. Lichatowich, cited in footnote 2.

[22]Report by P. Higgins, S. Dobush, and D. Fuller, cited in footnote 4.

For the Oregon coast, the Oregon Department of Fish and Wildlife (ODFW) conducted a review of anadromous fish stocks in the coastal basins.[23] In this report, the ODFW ranked stocks differently than had the AFS and the Humbolt Chapter reports. The ODFW used the terms "of special concern" to note a high-risk stock, and "depressed" to note a moderate-risk stock. The ODFW report also included the terms "unknown" and "healthy." Although they agreed with documentation of the widespread declines reported by the AFS, the ODFW added many additional stocks to the list from the AFS Report, and also considered several stocks to be in a somewhat better condition than reported by the AFS. Because the ODFW report reviewed only coastal stocks, all of their data applied to stocks within the range of the northern spotted owl and outside the range of this environmental assessment.

The Washington Department of Fisheries (WDOF) reported[24] on the status of anadromous fish stocks throughout the state. In addition to the WDOF, the Washington Department of Wildlife and technical staffs of 23 Native American tribes also contributed to the report. That report identified 78 salmon and 44 steelhead stocks as "depressed" (defined the same as "at moderate risk" of extinction in the AFS published report), and 11 salmon stocks and 1 steelhead stock as "critical" (defined the same as "at high risk" of extinction in the AFS published report). Of the 134 stocks in Washington identified by WDOF as depressed and critical, 71 occur in the Columbia River Basin.

The FEMAT report[25] reviewed and compared the above referenced reports. In general, each succeeding report added or subdivided stocks from the original list in the AFS published report. Including data from the AFS report, the Humboldt Chapter report, the ODFW report, and the WDOF report, FEMAT found a total of 314 anadromous fish stocks at-risk just within the range of the northern spotted owl, more than doubling that number originally reported for the same area in the AFS report (an increase of 178 over the original 136).

Assessments by researchers indicate that stream systems throughout California, Oregon, Washington, and Idaho, have been degraded considerably by human-induced cumulative effects. Such activities as livestock use, road construction, timber harvest, recreational use, channelization, and other watershed management projects and activities are the most common causal factors. Between 1987 and 1992, researchers from the Pacific Northwest Research Forest and Range Experiment Station (PNW) resurveyed 116 stream systems in Oregon, Washington, and Idaho, and compared the number of large, deep pools per stream mile--a primary indicator of high-quality, in-channel habitat condition, to the number documented during surveys conducted between 1935 and 1945. The PNW report[26] documents substantial decreases in the quality and quantity of large, deep pools throughout managed areas of the region. The number of large, deep pools decreased 58 percent in the Cowlitz River Basin, 41 percent in the Lewis River, 84 percent in the Elochoman River Basin, and 85 percent in the

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[23]Report by T.E. Nickelson, J.W. Nichols, A.M. McGie, R.B. Lindsay, D.L. Bottom, R.J. Kaiser, and S.E. Jacobs, cited in footnote 5.

[24]Report by Washington Department of Fisheries, Washington Department of Wildlife, and Western Washington Treaty Indian Tribes, cited in footnote 6.

[25]Report by Forest Ecosystem Management Assessment Team, cited in footnote 18.

[26]Report by J.R. Sedell and F.H. Everest, cited in footnote 7.

Yakama River Basin, all in Washington State; 78 percent in the Lewis and Clark River and 85 percent in the Clatskanie River, both in Oregon; and 52 percent in the Salmon River Basin of Idaho.

Pool-riffle ratios are a guage of aquatic habitat diversity, and are an indicator of the degree to which streams are capable of producing and supporting a varied and complex community of fish species. According to Oregon Game Commission surveys in the 1960s and Forest Service surveys in the 1970s (unpublished data), pool-riffle ratios have decreased from historic levels of about 50:50 to 20:80 or 10:90, indicating a dramatic loss of diversity and dimunition of fish habitat capability. BLM scientists found that of the 211 miles of anadromous fish habitat in that Agency's Salem District of western Oregon, 42 percent was in poor condition, 35 percent in fair condition, and 23 percent in good condition.[27] On Forest Service-administered lands, 80 percent of fish habitat in the upper Grande Ronde Basin fails to meet current forest plan standards and guidelines for water temperature, sediment levels, and riparian condition. Seventy percent of stream habitats of the Middle Fork Clearwater and Lochsa Rivers on Idaho's Clearwater National Forest fail to meet current forest plan standards and guidelines. These results provide confirmation that Agency-administered lands also have experienced deterioration of anadromous fish habitat condition.

Several papers recently have reviewed and reconfirmed the dependency of healthy anadromous fish stocks on high-quality freshwater habitats. Studies by R.J. Naiman and others defined ecologically healthy watersheds by the delivery and routing of water, sediment, and woody debris.[28] Healthy riparian areas provide the primary control for this delivery and routing. Riparian areas are critical to the maintenance of water temperature, habitat complexity, pools, sediment levels, and instream structure, which are necessary for the natural reproduction of anadromous fish stocks.[29]

The Agencies independently have examined the results of these and other studies (see Appendix A) and believe that the conclusions regarding declining status of anadromous fish stocks, degradation of aquatic and riparian habitat condition, and the causal link between the two are consistent with the Agencies' own studies. Forest plans and LUPs were intended by Congress to be readily adaptable to new information to make adjustments that assure sound resource management. A reasoned response to new information is crucial to the Agencies' success in meeting the "continuing compliance" obligations of NEPA, National Forest Management Act of 1976 (NFMA), FLPMA, ESA, and other environmental laws. By using the latest scientific information, the Agencies will better be able to ensure the long-term viability of anadromous fish species and the continuing production of goods and services from public lands.

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[27] R.A. House. 1992. *Management of Anadromous Salmon and Trout Habitat and Their Status in the Salem District.* Report of Bureau of Land Management, Salem, OR.

[28] Report by Naiman, R.J., T.J. Beechie, L.E. Benda, et al., cited in footnote 8.

[29] Gregory, S.V., F.J. Swanson, W.A. McKee, and K.W. Cummins. 1991. *An Ecosystem Perspective of Riparian Zones.* BioScience. 41:540-551. Naiman, R.J., and H. Decamps. (eds.). 1990. *The Ecology and Management of Aquatic-terrestrial Ecotones.* UNESCO, Paris. Report by Naiman, R.J., T.J. Beechie, L.E. Benda, et al., cited in footnote 8.

Decision Framework

Analyses and findings described in this environmental assessment will help the Agencies decide:

(1) whether to continue with management direction described in current forest plans and LUPs, or to institute interim management direction until longer-term management options proposed in the geographically specific EISs are evaluated and an alternative is approved and implemented;

(2) what direction would be necessary to arrest the degradation and begin the restoration of aquatic and riparian ecosystems during the interim period;

(3) which watersheds would be subject to interim direction; and

(4) whether interim direction would apply to:

a. only those projects and activities initiated during the next 18 months (e.g., where no contract has been let or rights conferred);

b. all proposed and ongoing projects and activities; or

c. all proposed and some of the ongoing projects and activities.

The geographically specific EISs will evaluate possible longer-term changes in anadromous fish habitat management direction within all or portions of the 15 national forests and 7 BLM districts described under *Proposed Action*, and may include alternatives that are not considered for interim application in this environmental assessment. The geographically specific EISs will complement aquatic and riparian provisions of the Northern Spotted Owl FSEIS and ensure consistently sound habitat management practices on lands administered by the Agencies throughout the range of anadromous fish in California, Oregon, Washington, and Idaho. The Agencies are examining the need for NEPA analyses of possible longer-term changes in anadromous fish habitat management direction for the 2 national forests and 5 BLM districts in Alaska.

PROPOSED ACTION

Geographic Range and Duration

The proposed action considered in this environmental assessment is to establish "interim" management direction that would arrest and reverse the decline in anadromous fish habitat on all or parts of 15 national forests[30] in 4 Forest Service Regions in 4 States, and 7 BLM districts in 4 States while the Agencies examine longer-term options that will be developed in geographically specific EISs. The geographically specific EISs are scheduled to be completed in 18 months. The proposed action together with actions taken under the Northern Spotted Owl FSEIS would provide an aquatic and riparian management strategy for all anadromous fish habitat in the contiguous United States. The proposed action would be a short-term effort to preserve the environmental status quo while the Agencies develop and evaluate a longer-term policy. The temporary nature of the proposed action would limit effects of the interim direction.

Areas considered in the proposed action are those anadromous watersheds in the contiguous United States which are outside the range of the northern spotted owl (Figure 1). The national forests considered in this assessment include:

STATE	REGION	NATIONAL FOREST
California	5	Lassen and Los Padres
Idaho	1 4	Bitterroot, Clearwater, Nez Perce, Boise, Challis, Payette, Salmon, and Sawtooth[31]
Oregon	6	Malheur, Ochoco, Umatilla, and Wallowa-Whitman
Washington	6	Okanogan

[30]These are all or part of those national forests listed in Appendix A of the *Informational Report--Background Report for the Development of the Forest Service Management Strategy for Pacific Salmon and Steelhead Habitat* (December 1992), which are not included in the Northern Spotted Owl FSEIS. In addition, this management direction would apply to any anadromous fisheries that are located in small portions of those national forests discussed in the Northern Spotted Owl FSEIS, which are technically outside the geographical scope of that document.

[31]The Sawtooth National Recreational Area and the Columbia River Gorge National Scenic Area also are included.

By State, the BLM districts include:

STATE	BLM DISTRICT
California	Bakersfield and Ukiah[32]
Idaho	Coeur d'Alene and Salmon
Oregon	Prineville and Vale
Washington	Spokane

Appendix B displays the estimated acreage in anadromous watersheds for each of the 7 BLM districts and 15 national forests. Approximately 15 million acres of anadromous watersheds are considered in this environmental assessment; however, the standards and guidelines proposed under the various alternatives examined would apply only to the defined Riparian Habitat Conservation Areas (RHCAs) within anadromous watersheds. Projects and activities that are not within defined RHCAs would continue to operate under direction in current forest plans and LUPs. As a consequence, there would be no effects upon existing resource users outside the defined RHCAs. As explained below, RHCAs would identify areas of the watershed that are most sensitive to management.

As part of the analysis for the Northern Spotted Owl FSEIS, "riparian reserves" were modeled using substantially the same criteria as is specified for RHCAs in the proposed action. In Key Watersheds, the reserves generally encompassed 40-50 percent of the westside watersheds, in non-key westside watersheds the reserves generally encompassed 25-45 percent.[33] Because drainage networks generally are less dense within the proposed action area than within the range of the northern spotted owl, application of the same criteria for delineating RHCAs within the proposed action area is likely to result in a smaller percentage of the watershed being included within the RHCA. As a result, considerably less than the approximately 15 million acres of anadromous watersheds would be subject to the proposed standards and guidelines.

Management Direction

The Agencies propose to adopt mitigation and management measures specified under Alternative 4 (PREFERRED). This alternative, which is described in detail in Appendix C, would provide interim management direction that would supplement LUPs and amend current forest plans to add new riparian goals, interim Riparian Management Objectives (RMOs), and standards and guidelines for application to all kinds of projects and activities within RHCAs. It also would require identification of Key Watersheds and provide a protocol for Watershed Analysis.

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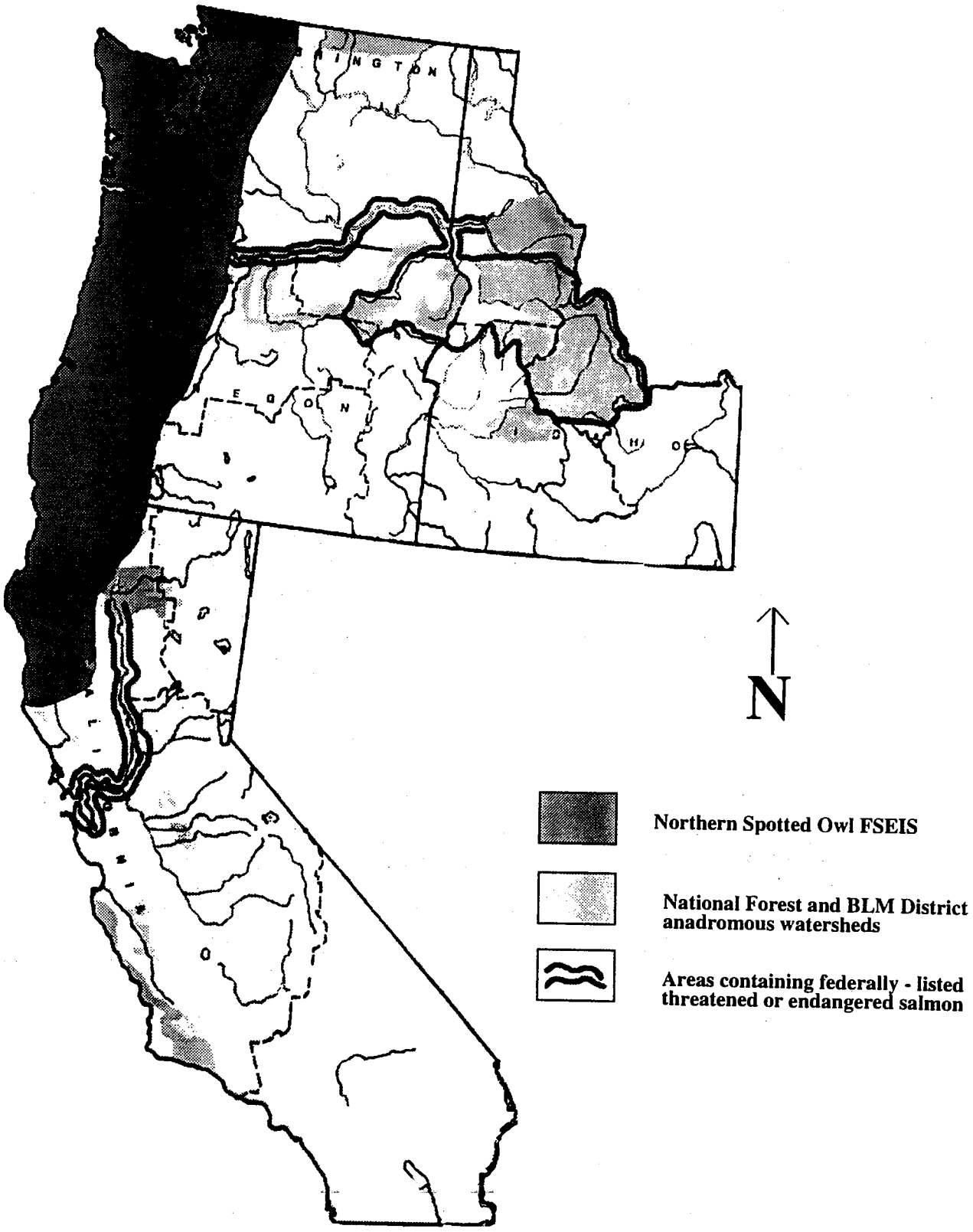
[32]This includes "eastside"portions of the Okanogan National Forest and the BLM's Ukiah District that were not considered in the Northern Spotted Owl FSEIS.

[33]J.R. Sedell. 1994. *Personal Communication.* Pacific NW Research Station, Corvallis, OR.

Figure 1. General Location of Proposed Action Area.



Riparian Goals would establish a common set of characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats. Because the quality of water and fish habitat in aquatic systems is inseparably related to the integrity of upland and riparian areas within the watersheds, the proposed action articulates several goals for watershed, riparian, and stream channel conditions, including the maintenance or restoration of: water quality, stream channel integrity, channel processes, sediment regime, instream flows, natural timing and variability of the water table elevation in meadows and wetlands, and the diversity and productivity of native and desired non-native plant, vertebrate, and invertebrate communities. These goals focus on ecological processes and functions under which the riparian and aquatic ecosystems developed and the unique genetic anadromous fish stocks evolved.

RMOs would establish measurable habitat parameters that together define good anadromous fish habitat and serve as indicators against which attainment, or progress toward attainment, of the goals can be measured. The proposed action would establish 6 landscape-scale interim RMOs (including 1 key and 5 supplemental features) that are good indicators of ecosystem health and are easily quantified and subject to accurate, repeatable measurements. For all areas (including forested and non-forested ecosystems) the key feature is the number of deep pools per mile of stream and supplemental features include water temperature and width-to-depth ratio. In forested ecosystems the amount of woody debris in the stream also is a supplemental feature. In non-forested ecosystems, stream bank stability and lower bank angle also are supplemental features. The proposed action would provide for watershed-specific tailoring of the interim RMOs through Watershed Analysis or as a result of ESA consultation.

Proposed standards and guidelines have been developed for management of timber, roads, grazing and recreation resources, minerals, fire and fuels, and general riparian areas, as well as for land uses such as those governed by leases, permits, rights-of-way, and easements. Standards and guidelines also have been developed for the restoration of watershed, fisheries, and wildlife habitat. The proposed standards and guidelines would provide management direction believed necessary to halt degradation and begin restoration to meet Riparian Goals and RMOs for stream channel, riparian area, and watershed. Standards and guidelines specified under the proposed action--for activities and projects in RHCAs, in combination with standards and guidelines that have been established in current forest plans and LUPs, have been designed to provide a benchmark for mitigation of management activities, to recognize the need for increased sensitivity to ecological balances, and to foster a continuing commitment to ecosystem management. The complete text of the standards and guidelines specified under the proposed action are included in Appendix C, pages C-8 through C-17.

The proposed action would establish interim RHCAs to identify areas in watersheds that are most sensitive to management. The standards and guidelines of the proposed action would be applied only within the RHCAs. Interim RHCAs would be based on geomorphic features such as the edges of the active stream channels, the top of the inner gorge, the extent of the 100-year flood plain, the outer edges of riparian vegetation, the height of site-potential trees, and the extent of unstable soils. Generally, interim RHCAs would include the following areas: 300 feet on either side of fish-bearing streams, 150 feet on either side of permanent non-fish-bearing streams, and around ponds, reservoirs, and wetlands greater than one acre, and 100 feet in Key Watersheds (50 feet in non-key watersheds) on either side of seasonally flowing or intermittent streams, and around wetlands less than one acre, and landslides and landslide-prone areas. In non-forested rangeland ecosystems, the interim RHCA width for permanently flowing fish-bearing and non-fish-bearing streams would be the extent of the 100-year floodplain. The proposed action would provide for watershed-specific tailoring of the interim RHCAs through Watershed Analysis or as a result of ESA consultation.

The proposed action would result in the designation of Key Watersheds within the proposed action area. Key Watersheds would be selected from among those that are important to at-risk anadromous fish stocks, or those that are providing, or are readily capable of being restored to provide "good" anadromous fish habitat. Key Watersheds would be selected to contribute to a network of watersheds across the landscape that provide for the long-term viability of anadromous fish. Identified Key Watersheds would receive priority for Watershed Analysis, as well as maintenance and restoration projects and activities. RHCAs within Key Watersheds would include a larger area than in non-key watersheds. Specifically, more area around seasonally flowing or intermittent streams, wetlands, and landslide or landslide-prone areas would be included within RHCAs in Key Watersheds.

A Watershed Analysis protocol would be established under the proposed action to screen and characterize watershed condition and identify areas that are in need of immediate, corrective management. This more complete assessment would identify watershed restoration objectives, strategies, and priorities, and would provide the scientific basis for watershed-specific adjustments to the interim RMOs and interim RHCAs. To provide accountability, the proposed action would establish a certification process through which the responsible FS and/or BLM line officer(s) would certify when the analysis has been conducted and completed according to expected scientific standards.

The proposed action includes both management measures (e.g. Watershed Analysis) and mitigation measures (e.g. standards and guidelines). Implementation would not change the physical environment. However, the proposed action would establish a management regime and system of mitigation measures that would maintain or protect the environmental status quo until the more geographically specific EISs are completed. Under the proposed action, subsequent decisions that would change the environment (i.e. proposed projects and activities within RHCAs) would be subject to the standards and guidelines. Evaluation of all proposed projects and activities would continue through site-specific analyses that are required by NEPA. Further, the standards and guidelines also would apply to high-priority, ongoing projects and activities.

Proposed projects and activities include those initiated during the interim period, as well as those that have been approved, but implementation has not begun and contracts or permits have not been issued. The high-priority, ongoing projects and activities are those determined, on the basis of a case-by-case evaluation, to pose unacceptable risk to habitat condition or at-risk anadromous fish. When determining if an unacceptable risk is being posed by an ongoing project or activity, managers will consider such factors as the condition of the watershed, the status of anadromous fish stocks in the watershed, and the magnitude, frequency, duration, and timing of the impacts caused by the ongoing project or activity.

All ongoing projects and activities will be examined. For those ongoing projects and activities that may be associated with detrimental effects on habitat condition and/or anadromous fish stocks, administrative and monitoring procedures will be used first to determine compliance with the standards and guidelines, contract provisions, annual operating plans, special-use and other permit terms, and other project-specific direction that were in place at the time of project approval. Additionally, such examination would determine and document possible unacceptable risk and identify if changes in ongoing projects and activities may be needed. The evaluation of ongoing work and the case-by-case determination of possible unacceptable risk will be conducted during the interim period, while the geographically specific EISs are being completed. Those projects and activities that may pose an unacceptable risk might require additional NEPA analysis. Depending on the

importance and scope of such projects, it is possible that some may need to be examined as part of the analysis in the geographically specific EISs. Generally, the biological evaluation process described in FS Manual 2670 and referenced in BLM Manual 6720 and 6840 may be used to make the determination of unacceptable-risk. Ongoing projects not considered to pose unacceptable risk will continue during the interim period, under the direction that was in effect at the time of project approval, even if such projects are not fully in compliance with standards, guidelines, and other provisions of the proposed action.

The Agencies' Approaches

The FS and the BLM propose to apply interim direction by means of different administrative procedures.

BLM Approach:

> For the BLM, proposed interim direction (i.e., standards, guidelines, and procedures) that is in conformance with current LUPs would be incorporated into future and, depending on the alternative selected, some or all ongoing projects and activities. For those provisions of the interim direction not in conformance, LUPs would be amended (with appropriate NEPA documentation) prior to implementation. If the interim direction is not in conformance or the LUP has not been amended to achieve conformance, direction as described in the current LUP would be applied to projects and activities. Preliminary reviews of existing LUPs indicate that the proposed management direction, in many cases, would be in conformance with existing LUPs. Conformance means that a resource management action shall be specifically provided for in the plan, or if not specifically mentioned, shall be clearly consistent with other terms, conditions, and decisions of the approved plan or plan amendment.

FS Approach:

> For the FS, under provisions of the NFMA, the proposed interim direction would amend forest plans for each of the 15 national forests listed to incorporate new standards, guidelines, and management direction. These new standards, guidelines, and direction will supersede or replace conflicting direction described in forest plans that provide less protection. Thereafter, future and, depending on the alternative selected, some or all ongoing projects and activities would be evaluated to determine if changes are warranted. The FS believes the preferred alternative would not cause significant amendment as defined by NFMA for the following reasons: (1) It would be applied for a limited time. (2) It would result in changes to standards and guidelines in current forest plans that are minor in effect (if not in type). (3) It would not substantially change the desired future condition from that contemplated in the current Forest Plans. (4) It would not alter long-term levels of goods and services projected by current forest plans.

On its own, none of the alternatives examined in this environmental assessment would change the physical environment. Any subsequent proposed actions that would change the environment will be subject to mitigation measures prescribed under the interim direction adopted. Any project or activity proposed within lands administered by the Agencies during the interim period would be subject to appropriate, site-specific analyses required by NEPA and/or provisions of the ESA, as well as relevant planning regulations. Thus, the site-specific effects of application of the standards and guidelines specified under any alternative would be

disclosed at the project level of decisionmaking, depending on the previous level of environmental analysis. Such projects or activities would be carried out only after the Agencies have undertaken the appropriate level of NEPA analysis. For more information on this process (including provisions for public notice, review and comment, and administrative appeal) refer to 40 CFR 1500-1508 as well as the FS NEPA Handbook FSH 1909.15 and FS Manual FSM 1950 and the BLM NEPA Handbook, Manual 1792. Further, those ongoing projects and activities that pose an unacceptable risk to aquatic and riparian habitat and at-risk anadromous fish stocks would require additional NEPA analysis prior to incorporating changes in project direction. In addition, consultation with the NMFS and the USFWS pursuant to the ESA will be completed by the Agencies prior to any implementation of interim direction.

The more geographically specific EISs, which are scheduled to be completed in 18 months, could result in decisions that would supersede the interim direction and require further modifications to projects and activities. The decision regarding which alternative is appropriate for implementation during the interim period would not preclude consideration in the geographically specific EISs of any alternatives that may be developed for longer-term management.

ISSUES

From questions raised in briefings with Members of Congress and in conversation and correspondence with employees of the Agencies, as well as with representatives from other Federal and State agencies, Tribal governments, service and commodity interests, and conservation organizations, the Interdisciplinary Team (ID Team) identified five issues as relevant to the proposed action. These issues, which have been addressed in formulating and evaluating action alternatives, are:

1. **Maintaining stocks of anadromous fish:** A number of anadromous fish stocks have been listed by the NMFS as threatened or endangered, in part as a result of habitat modifications caused by past and ongoing resource management practices on Federal, State, and private land. Dam construction and operation, water diversions, fish hatchery operations, and fish harvest also have contributed to the listings. Additional anadromous fish stocks have been identified as at risk of extinction, and in the near future may be petitioned for listing pursuant to the ESA. The Agencies have an obligation to provide habitat conditions necessary to conserve the viability of listed anadromous fish stocks and protect or restore critical habitat. They also have section 7(a) obligations to conserve anadromous fish stocks not now listed under the ESA and to manage habitat in ways that would halt or reverse trends toward future listing.

2. **Providing management direction to successfully comply with consultation required by the Endangered Species Act:** Where there are listed stocks of anadromous fish, management activities conducted under current forest plans and LUPs must undergo consultation pursuant to the ESA--incorporating, where appropriate, reasonable and prudent alternatives identified by NMFS as necessary to avoid jeopardy to listed species or adverse modification of designated critical habitat. Protective measures identified during ESA consultation may result in changes in project design and/or project-specific amendments of forest plans and LUPs. Rather than designing projects according to standards described in current forest plans and LUPs, and risk having to redesign projects following consultation, land managers and project proponents may find it more efficient and cost-effective to incorporate into initial project planning those measures that are necessary to avoid jeopardy to listed species or adverse modification of critical habitat.

3. **Considering the ability of national forests and BLM districts to provide traditional amounts and kinds of goods and services:** The implementation of any proposed interim strategy, including the alternative to continue management under current forest plan and LUP direction, may affect the flow of goods and services that are provided from Federal lands and may directly or indirectly affect management activities conducted on other Federal, State, and private lands. Any interim management strategy must consider the demand for and the supply of goods and services, and the often conflicting issues that can affect supply.

4. **Integrating proposed interim direction for management of anadromous fish habitat with other planning efforts:** The development of an appropriate interim strategy for managing anadromous fish habitat must take into account other strategies and approaches that have been proposed or implemented within or adjacent to the areas considered in this environmental assessment. The Northern Spotted Owl FSEIS, pending legislative or administrative action on Rangeland Reform, mining reform, etc., have described the need for flexible, coordinated resource management strategies that would help maintain and restore the health of riparian and aquatic ecosystems that are necessary for the survival of listed and other at-risk anadromous fish. Any interim strategy for the proposed action area must be

coordinated with other habitat management efforts and be based on cooperative management of aquatic and riparian ecosystems throughout the range of anadromous fish. In addition, any interim strategy must take into account and be coordinated with efforts undertaken to address other non-habitat factors influencing the status of anadromous fish (e.g. dam construction and operation, water diversions, fish hatchery operations, and fish harvest practices).

5. **Integrating new scientific knowledge into the management of anadromous fish:** As explained above, new scientific knowledge on the status of anadromous fish stocks and the condition of anadromous fish habitat has become available. Research on these and other matters is ongoing. Any interim strategy must allow for the application of new scientific knowledge and provide a mechanism for adapting management direction to watershed-specific conditions. Further, any interim strategy must include "implementation and effectiveness monitoring" and must include mechanisms for adapting management practices in response to the information gained.

COMPONENTS OF THE ALTERNATIVES

The development of alternatives included in this environmental assessment focused around three component parts that define the range of alternatives for interim direction. These three components are:

(1) the geographic range of the proposed action;

(2) the range of interim management direction, including the standards, guidelines, and procedures; and

(3) the range of projects and activities to which interim standards, guidelines, and procedures would apply.

Formulating alternatives around these three components was not a hierarchical process, ie., deciding on the range of projects and activities, then prescribing direction and geography, or vice versa. Rather, the alternatives for interim direction were formulated through an iterative process, which considered various combinations of the three aspects (geography, management direction, and projects and activities covered) that fit logically together.

Geographic Range

The ID Team determined that most of the new information regarding declines in anadromous fish stocks and the degradation of aquatic and riparian habitat is more relevant to changes of habitat within the contiguous United States than in the State of Alaska. Management direction already is being evaluated for that part of the anadromous fish range in the contiguous United States that is also within the range of the northern spotted owl. As a result, interim direction is proposed for lands administered by the Agencies within anadromous watersheds in California, Oregon, Washington, and Idaho, excluding that portion of the Pacific Northwest for which appropriate strategies already have been considered in the Northern Spotted Owl FSEIS.

Range of Management Direction

The range of standards, guidelines, and procedures considered for interim direction is based on 10 preliminary proposals, or management direction options, developed by Agency researchers and managers from Oregon, Washington, California, Idaho, and Alaska. The management direction options contain one or more of the seven components defined below:

Riparian Goals: Riparian goals establish a common set of the characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats (e.g., maintaining or restoring water quality, stream channel integrity, channel processes, sediment regime, instream flows, natural timing and variability of the water table elevation in meadows and wetlands, and the diversity and productivity of plant communities).

Riparian Management Objectives: RMOs establish a number of stream- and streamside-habitat conditions that together define good anadromous fish habitat at the landscape scale, and serve as indicators against which attainment, or progress toward attainment, of the goals can be measured. These objectives consist of such parameters as the number of deep pools per mile of stream, water temperature, amount of woody debris in the stream, stream bank stability, width-to-depth ratio, and bank angle. Several alternatives

provide for landscape-scale interim objectives that can be refined and tailored to specific watershed conditions through the Watershed Analysis process or be modified as a result of ESA consultation.

Standards and Guidelines: Standards and guidelines constrain how riparian and other important areas (such as landslide and landslide-prone areas) are managed. They provide management direction believed necessary to meet Riparian Goals and RMOs for stream channel, riparian, and watershed conditions.

Riparian Management Areas: Riparian management areas describe portions of the watershed that require special management attention, and to which the standards and guidelines apply. These areas most directly affect the hydrologic, geomorphic, and ecologic processes of the riparian ecosystem and, depending on the alternative, can include permanent and intermittent streams, wetlands, ponds, lakes, reservoirs, and landslide or landslide-prone areas. Several alternatives establish interim RHCAs with widths dependent on the type of stream or area and which, on average, varies from 50 feet to 300 feet on either side of the water body. Interim RHCAs can be refined and tailored to specific watershed conditions through the Watershed Analysis process or be modified as a result of ESA consultation.

Key Watersheds: Key Watersheds are selected from among those watersheds important to at-risk anadromous fish stocks, or those that are providing, or are readily capable of being restored to provide "good" anadromous fish habitat. Key Watersheds are selected to contribute to a network of watersheds across the landscape that provide for the long-term viability of anadromous fish. Key Watersheds receive priority for Watershed Analysis, as well as maintenance and restoration projects and activities. Key Watersheds may be afforded stricter management standards, guidelines, and procedures than non-key watersheds.

Watershed Analysis: Watershed Analysis identifies areas within a watershed that need immediate, corrective management, and it provides a more complete assessment of cumulative effects. Watershed Analysis also provides the scientific basis for watershed-specific adjustments to the interim RMOs and interim RHCAs. The extent of Watershed Analysis necessary will vary by alternative.

Watershed Restoration: Several alternatives provide guidance for landscape/watershed-scale restoration. Key Watersheds would receive priority for aquatic and riparian habitat restoration.

Range of Projects and Activities

For the application of interim management direction to Federal projects and activities on Agency-administered lands, this environmental assessment considers three options:

1. Apply the standards, guidelines, and procedures to: (a) proposed projects and activities that have not yet been approved, and (b) projects and activities that have been approved, but implementation has not begun and contracts or permits have not been issued [both (a) and (b) hereinafter collectively are referred to as "proposed projects and activities"].

2. Apply the standards, guidelines, and procedures to: (a) proposed projects and activities; and (b) those high-priority, ongoing projects and activities that, through a case-by-case evaluation, are determined to be posing an unacceptable threat to aquatic and riparian habitat or at-risk anadromous fish. When determining if an unacceptable threat is being posed by an ongoing project or activity, such factors as the condition of the watershed, the status of anadromous fish stocks in the watershed, and the magnitude, frequency, duration, and timing of the impacts caused by the ongoing activity shall be considered.

3. Apply the standards, guidelines, and procedures to: (a) proposed projects and activities; and (b) all ongoing projects and activities.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Outside Agency Jurisdiction Option Eliminated

One option was considered that would address all four principal factors limiting anadromous stock survival that were discussed on page 2, but the option was eliminated from detailed study.

This option would have considered the broad geographical area within the range of Pacific anadromous fish and evaluated the principal human actions that influence anadromous fish populations, including dam construction and operation, water diversions, habitat modifications, fish hatchery operations, and fish harvest. This option would have evaluated management direction for all limiting factors, and would have involved the coordination of a number of Federal and State agencies that have jurisdiction over commercial, sport, and subsistence fish harvest, hatcheries, dams, and habitat; including, for example, the NMFS, USFWS, State fish and game departments, and Federal and State water quality regulatory agencies. This option was not analyzed in detail because efforts by responsible agencies to develop management strategies for dam construction and operation, water diversions, fish hatchery operations, and fish harvest practices, although underway, are at the formative stage. The time required to develop reasonable alternatives that address all factors affecting anadromous fish stocks and complete the coordinated and highly complex analyses would substantially delay implementation of measures necessary to effectively manage habitat on Agency administered lands. Both Agencies remain alert for opportunities to coordinate their efforts to improve habitat conditions with efforts by other Federal and State agencies to evaluate the non-habitat related factors. Each will take into consideration the evaluations of the other Federal and State agencies..

Geographic Options Eliminated

Three geographic options were eliminated from detailed study:

Alternative A: The option of applying interim direction to lands administered by the Agencies only within specific, designated Key Watersheds of the contiguous United States that contain at-risk stocks of anadromous fish was eliminated from detailed study because it fails to provide a level of protection necessary to ensure habitat conditions that would support viable and sustainable anadromous fish populations, and fails to assure adequate water quality in non-key watersheds. By applying interim direction only to Key Watersheds there would be no assurance that options that will be considered in the geographically specific EISs would not be compromised by actions taken in non-key watersheds during the interim period.

Alternative B: The option of applying interim direction to Agency-administered lands in Alaska was eliminated for the following reasons:

1. Generally, anadromous fish stocks and habitat conditions in Alaska are not as degraded as those in the contiguous United States. Agency biologists and others have determined that these stocks generally are not in need of interim protection to ensure that options are maintained.

2. The FY 1994 Interior and Related Agencies Appropriations Act contains language that prohibits the application of PACFISH standards and guidelines to the Tongass National Forest during fiscal year 1994.[34]

3. During FY 1994, the Agencies will conduct stream analyses and studies and will review procedures regarding land management to evaluate the effectiveness of current stream protection and determine the need for additional protection of lands and resources they administer in Alaska.

Alternative C: The option of applying interim direction to watersheds beyond the range of anadromous fish, but where there is habitat important to at-risk resident fish species--such as the bull trout, was eliminated because it is beyond the scope of this environmental assessment, and because independent initiatives to address resident fish habitat management already have begun.[35] This option will be further examined in the geographically specific EISs, which will consider local conditions and the status of various resident fish stocks.

Public involvement during the scoping process for the geographically specific EISs will examine options for management after the interim period and may produce alternatives that include some of the geographic options considered but eliminated from detailed study.

Management Direction Options Eliminated

A number of management direction options for standards, guidelines, and procedures were considered, ranging from current direction to alternatives specifying riparian goals, interim riparian management objectives, standards and guidelines, a new definition of riparian area, Key Watershed identification, and increasing levels of road and/or watershed analysis.

Six management direction alternatives were eliminated from detailed study:

Alternative A: This alternative generally assumed that forest plan and LUP goals, objectives, standards, guidelines, riparian areas, and procedures are sufficient for interim protection. However, it would have modified current direction by (1) applying draft Forest Service California Region (R5) minerals management standards and guidelines within riparian areas;

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[34]P.L. 103-138. Nov 11, 1993. 107 Stat. 1379. Department of Interior and Related Agencies Appropriation Act of 1994.

[35]For example, a Habitat Conservation Assessment (HCA) to determine bull trout habitat requirements and habitat condition has been completed, and HCAs for several inland cutthroat trout species are underway. In addition, the USFWS, BLM, NPS, FS, NMFS have held preliminary interagency planning meetings to initiate development of an agreement regarding habitat management to conserve bull trout throughout its range. The Bureau of Indian Affairs and the Soil Conservation Service are expected to join the interagency effort.

and (2) requiring the identification of Key Watersheds and specifying "no net gain" in road mileage within them. This alternative would have provided for neither road nor watershed analyses.

Alternative B: Similar to Alternative A, this alternative would have modified current direction with R5 minerals management standards and guidelines within riparian areas. It also would have applied riparian standards and guidelines that were developed for the Willamette National Forest;[36] and required a reduction in road mileage within Key Watersheds. This alternative would not have provided for road or Watershed Analyses.

Alternative C: This alternative was derived from R5 draft standards and guidelines for riparian management. It would have imposed standards, guidelines, and procedures adopted from R5's riparian management direction for Zones 1 and 2.[37] It would have required identification of Key Watersheds. Roads standards would have specified construction that would accommodate 100-year flood events in non-key watersheds and 150-year flood events in Key Watersheds. It provided for road analysis, but not for Watershed Analysis.

Alternative D: This alternative would have modified current direction by applying the minerals area management guidance described in Appendix C for Alternatives 3 and 4. Further, it would have applied the remaining standards and guidelines and RHCAs described in Appendix C for Alternatives 3 and 4 in Key Watersheds and areas not meeting current standards and guidelines. In all other watersheds, Alternative D would have applied the riparian guidance described under Alternative C. This alternative would have provided for Watershed Analysis.

Alternative E: This alternative would have modified current direction by applying the goals, interim RMOs, standards and guidelines, interim RHCAs, Key Watershed identification, and Watershed Analysis protocol specified in Appendix C for Alternatives 3 and 4. This alternative differed from Alternatives 3 and 4 by specifying a 180- to 200-year timber rotation within all watersheds. This alternative would have provided for Watershed Analysis.

Alternative F: This alternative is identical to Alternative 9 in the Northern Spotted Owl DSEIS. The goals, standards and guidelines, Riparian Reserves, Key Watershed identification, and Watershed Analysis protocol of this alternative are substantially the same as those described for Alternatives 3 and 4 in Appendix C. However, it differed from Alternatives 3 and 4 in two ways: (1) Alternative F would have limited the construction of new roads in roadless areas; a provision not included in Alternatives 3 and 4. Nonetheless, the presence or absence of this provision would not make a substantial difference, because current direction requires a project-level analysis of any entry into roadless areas that could be expected to extend beyond the interim period, and Alternatives 3 and 4 also require completion of Watershed Analysis prior to road or landing construction in an RHCA. (2) Alternative F would not have included interim RMOs (the objectives specified for this alternative were comparable to the goals contained in Alternatives 3 and 4), but instead would

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[36]Gregory, S. Askenas, L. 1990. *Riparian management guide*, Willamette National Forest, Portland, OR, USDA-Forest Service, Pacific Northwest Region. 120 p.

[37]These standards and guidelines are included in the draft forest plans for the Klamath, Mendocino, Shasta-Trinity, and Six Rivers National Forests.

depend on Watershed Analyses to establish RMOs, ie., interim RMOs would not have been established to guide decisions prior to completion of Watershed Analyses.

Alternatives A, B, and C were not analyzed in detail for interim direction because they would not have provided comprehensive direction addressing the full suite of management actions that can occur on lands administered by the Agencies. Further, these three alternatives would not have included a Watershed Analysis protocol providing for a comprehensive and consistent evaluation of watershed condition, which would facilitate tailoring landscape-scale information and expectations to the capabilities of specific watersheds. By implementing any of these alternatives for a short, interim period, there would have been no assurance that options to be considered in the geographically specific EISs would not be compromised by management activities not covered by the direction described by them. In addition, the standards, guidelines, and procedures of Alternatives A, B, and C were not believed to be sufficient to ensure successful ESA consultation with the NMFS on projects and activities in those areas where anadromous fish are listed as threatened or endangered.

Alternatives D, E, and F were not analyzed in detail for interim direction because they include management direction similar to that contained in Alternatives 3, 4, and 5, which are carried forward for detailed evaluation in this environmental assessment. Also, as discussed above, the differences among Alternatives D, E, and F, when compared to alternatives 3, 4, and 5, were not considered substantial over the interim period.

ALTERNATIVES CONSIDERED IN DETAIL

This environmental analysis examines five alternatives in detail. The alternatives considered in detail represent combinations of four options for management direction, and three options for the range of projects and activities. All are applied only to those anadromous watersheds outside the range of the northern spotted owl and within the contiguous United States. This area includes anadromous watersheds on the 15 national forests and 7 BLM districts listed under the *PROPOSED ACTION*. The five alternatives are compared in Table 1. Standards, guidelines, and procedures specified for the five alternatives are described in detail in Appendix C, and the special riparian management areas to which the standards and guidelines apply are depicted in Figures 2-4. The alternatives were designed to provide progressively more protection of habitat and resources within the affected area. For example, riparian goals and objectives, special standards and guidelines, riparian areas, special procedures, and other management actions afford more habitat protection under Alternative 2 than under the no-action alternative, and protection is increased further under Alternative 3. Alternative 5 affords the most protection, although certain tradeoffs in resource outputs may make it more impractical than another alternative.

A summary discussion of the scientific basis and ecological principles supporting elements of the five alternatives is included in the process records.[38] The alternatives, particularly Alternatives 3-5, include provisions to facilitate incorporation of new information and Agency responsiveness to changed circumstances. The five alternatives assume that geographically

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[38]USDA Forest Service - USDI Bureau of Land Management. 1994. Summary of scientific principles followed in developing alternatives for an *Environmental Assessment: Interim Strategies for Managing Anadromous Fish-Producing Watersheds on Federal Lands in Eastern Oregon and Washington, Idaho, and Portions of California*, Internal report to the ID Tean

specific EISs to evaluate the need for longer-term changes in management direction will be completed in the scheduled 18 months, and that decisions resulting from the longer-term analyses could result in changes to forest plans, LUPs, or regional guides.

Alternative 1. Under this alternative, the Agencies would manage national forest and public land resources under direction specified in current forest plans and LUPs, without any adjustment during the interim period. NEPA compliance would be required for all projects and activities. Under provisions of the ESA, consultation with either the NMFS (for anadromous fish species and marine mammals) or the USFWS (for terrestrial and freshwater species) would be necessary where projects and activities may affect listed species or critical habitat. Responsible officials also would be required to identify any reasonable and prudent alternatives that may be needed to avoid jeopardy to a listed species or the destruction or adverse modification of critical habitat.

Alternative 2. This alternative would provide management direction that would modify current direction (as specified in Alternative 1). It would include standards and guidelines for road systems construction and reconstruction, logging slash treatment and prescribed fire, livestock grazing, and riparian and fish-habitat restoration. It would provide riparian protection zones of approximately 300 feet on either side of fish-bearing streams, 150 feet on either side of permanent water courses, and 50 feet on either side of intermittent streams in areas with moderately to highly unstable soils. It also would require the identification of Key Watersheds and provide for road- and cumulative-effects analyses. The direction provided under this alternative includes the riparian and aquatic provisions of the watershed and fish habitat emphasis option detailed in the October 8, 1991, report by the Scientific Panel on Late-Successional Forest Ecosystems (Scientific Panel Report), which was presented to the Agriculture Committee and the Merchant Marine and Fisheries Committee of the U.S. House of Representatives.[39] Standards, guidelines, and procedures specified under this alternative would apply only to proposed projects and activities, and would have no effect on ongoing projects and activities.

Alternative 3. This alternative would provide management direction that would modify current direction (as specified in Alternative 1). It would include riparian goals, interim RMOs, and standards and guidelines for all kinds of projects and activities. Interim RHCAs would be established to identify areas of watersheds most sensitive to management. RHCAs would be based on geomorphic features and would include the following (approximate) areas: 300 feet on either side of fish-bearing streams, 150 feet on either side of permanent non-fish bearing streams, and around ponds, reservoirs, and wetlands greater than one acre, and 100 feet in Key Watersheds (50 feet in non-key watersheds) on either side of seasonally flowing or intermittent streams, and around wetlands less than one acre, as well as landslides and landslide-prone areas. In non-forested rangeland ecosystems, the interim RHCA width for permanently flowing streams would be the extent of the 100-year floodplain. This alternative also would require identification of Key Watersheds and provide a protocol for Watershed Analysis. It is not anticipated that extensive Watershed Analysis would be initiated under this alternative. The standards, guidelines, and procedures would apply only to proposed projects and activities. They would not apply to ongoing projects and activities.

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[39]K.N. Johnson, J.F. Franklin, J.W. Thomas, and J. Gordon. 1991. *Alternatives for Management of Late-Successional Forests of the Pacific northwest.* A report to the Agriculture Committee and Merchant Marine Fisheries Committee of the U.S. House of Representatives.

Alternative 4 (PREFERRED): This alternative would provide management direction that would modify current direction (as specified in Alternative 1) with the management direction that is specified under Alternative 3. It would include riparian goals, interim RMOs, and standards and guidelines for all kinds of projects and activities. RHCAs would be established to identify areas of watersheds most sensitive to management. RHCAs would be based on geomorphic features and would include the following (approximate) areas: 300 feet on either side of fish-bearing streams, 150 feet on either side of permanent non-fish bearing streams, and around ponds, reservoirs, and wetlands greater than one acre, and 100 feet in Key Watersheds (50 feet in non-key watersheds) on either side of seasonally flowing or intermittent streams, and around wetlands less than one acre, as well as landslides and landslide-prone areas. In non-forested rangeland ecosystems, the interim RHCA width for permanently-flowing streams would be the extent of the 100-year floodplain. It also would require identification of Key Watersheds and provide a protocol for Watershed Analysis. Management direction would apply to high-priority, ongoing projects and activities, as well as to proposed projects and activities. The high-priority, ongoing projects and activities would be defined as those determined, on a case-by-case evaluation, to pose unacceptable risk to habitat condition or at-risk anadromous fish. Because of the need to conduct a case-by-case evaluation of ongoing projects and activities, it would be expected that Watershed Analysis would be initiated in more watersheds under this alternative than would be initiated under Alternative 3. All proposed and some ongoing projects and activities would be modified, if necessary. To the extent that this alternative would require modification of valid, existing rights, compensation for loss of those rights would have to be made.

Alternative 5: This alternative would provide management direction that would modify current direction (as specified in Alternative 1). It would include the same riparian goals, interim RMOs, and standards and guidelines for all kinds of projects and activities as specified in Alternatives 3 and 4. RHCAs would be established to identify watershed areas most sensitive to management. RHCAs would be based on geomorphic features and would include the following (approximate) areas in all watersheds: 300 feet on either side of fish-bearing streams, 150 feet on either side of permanent non-fish bearing streams, and around ponds, reservoirs, and wetlands greater than one acre, and 100 feet on either side of seasonally flowing or intermittent streams, and around wetlands less than one acre as well as landslides and landslide-prone areas. In non-forested rangeland ecosystems, the interim RHCA width for permanently-flowing streams would be the extent of the 100-year floodplain. It also would require identification of Key Watersheds and require that Watershed Analysis be initiated in all Key Watersheds during the interim period and be completed prior to initiation of new projects and activities in these areas. Management direction would be applied to all ongoing and proposed projects and activities. To the extent that this alternative would require modification of valid, existing rights, compensation for loss of those rights would have to be made.

Table 1. Summary Comparison of Alternatives Considered in Detail.

ALTERNATIVE	RIPARIAN GOALS/ OBJECTIVES	SPECIAL STANDARDS AND GUIDELINES	RIPARIAN AREAS	SPECIAL PROCEDURES	EFFECTED MANAGEMENT ACTIONS
1	Current plan goals and objectives	Current plan S&Gs	Current plan riparian buffers	Watershed Analysis/Key Watershed designation not required	Proposed
2	Scientific Panel Report goals & objectives	Scientific Panel Report S&Gs for roads, logging slash treatment & fire, range, restoration	Riparian areas: fish bearing = 300 feet permanent = 150 feet some intermittent = 50 feet	Road analysis and cumulative effects analysis initiated/Key Watersheds designated	Proposed
3	New riparian goals and quantified interim riparian management objectives	Increased S&Gs for all activities: timber, roads, grazing, recreation, minerals, fire/fuels, lands, general riparian area, and fisheries and wildlife management, and watershed and habitat restoration	RHCA zones: fish bearing streams = 300 feet permanent non-fish bearing steams, ponds, reservoirs, and wetlands > 1 acre = 150 feet intermittent streams, wetlands < 1 acre, and landslide or landslide prone areas = 100 feet in Key Watersheds and = 50 feet in non-key watersheds	Watershed Analysis initiated/Key Watersheds designated	Proposed
4	New riparian goals and quantified interim riparian management objectives	Increased S&Gs for all activities: timber, roads, grazing, recreation, minerals, fire/fuels, lands, general riparian area, and fisheries and wildlife management, and watershed and habitat restoration	RHCA zones: fish bearing streams = 300 feet permanent non-fish bearing steams, ponds, reservoirs, and wetlands > 1 acre = 150 feet intermittent streams, wetlands < 1 acre, and landslide or landslide prone areas = 100 feet in Key Watersheds and = 50 feet in non-key watersheds	Watershed Analysis initiated/Key Watersheds designated	Proposed and some ongoing

Table 1, cont. Summary Comparison of Alternatives Considered in Detail.

ALTERNATIVE	RIPARIAN GOALS/ OBJECTIVES	SPECIAL STANDARDS AND GUIDELINES	RIPARIAN AREAS	SPECIAL PROCEDURES	EFFECTED MANAGEMENT ACTIONS
5	New riparian goals and quantified interim riparian management objectives	Increased S&Gs for all activities: timber, roads, grazing, recreation, minerals, fire/fuels, lands, general riparian area, and fisheries and wildlife management, and watershed and habitat restoration	RHCA zones: fish bearing streams = 300 feet permanent non-fish bearing steams, ponds, reservoirs, and wetlands > 1 acre = 150 feet intermittent streams, wetlands < 1 acre, and landslide or landslide prone areas = 100 feet	Complete Watershed Analysis required in Key Watersheds prior to initiation of new projects & activities/Key Watersheds designated	Proposed and all ongoing

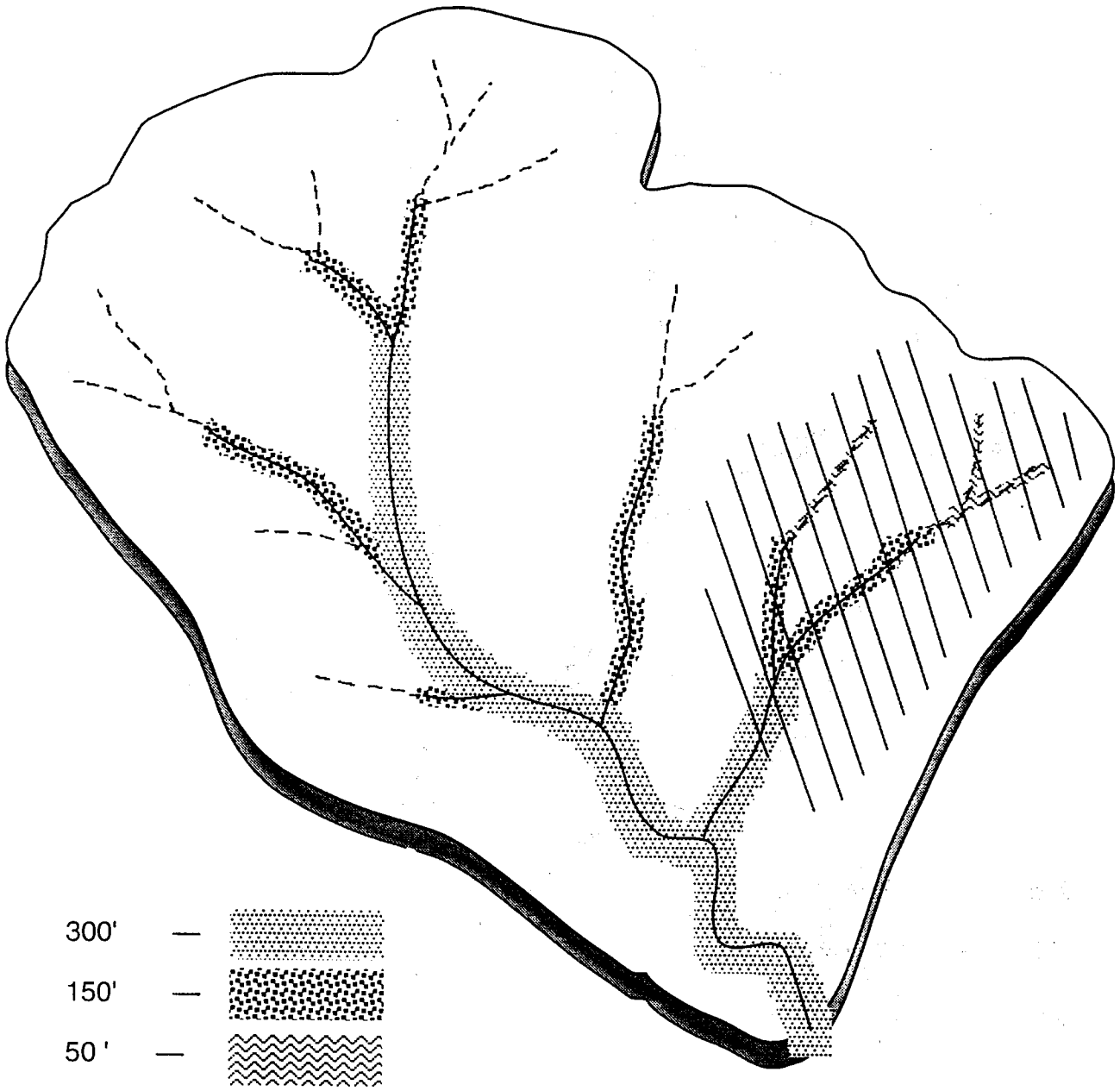

Figure 2. Schematic Delineation of Riparian Area Under Alternative 2. Hatch area denotes landslide-prone area.

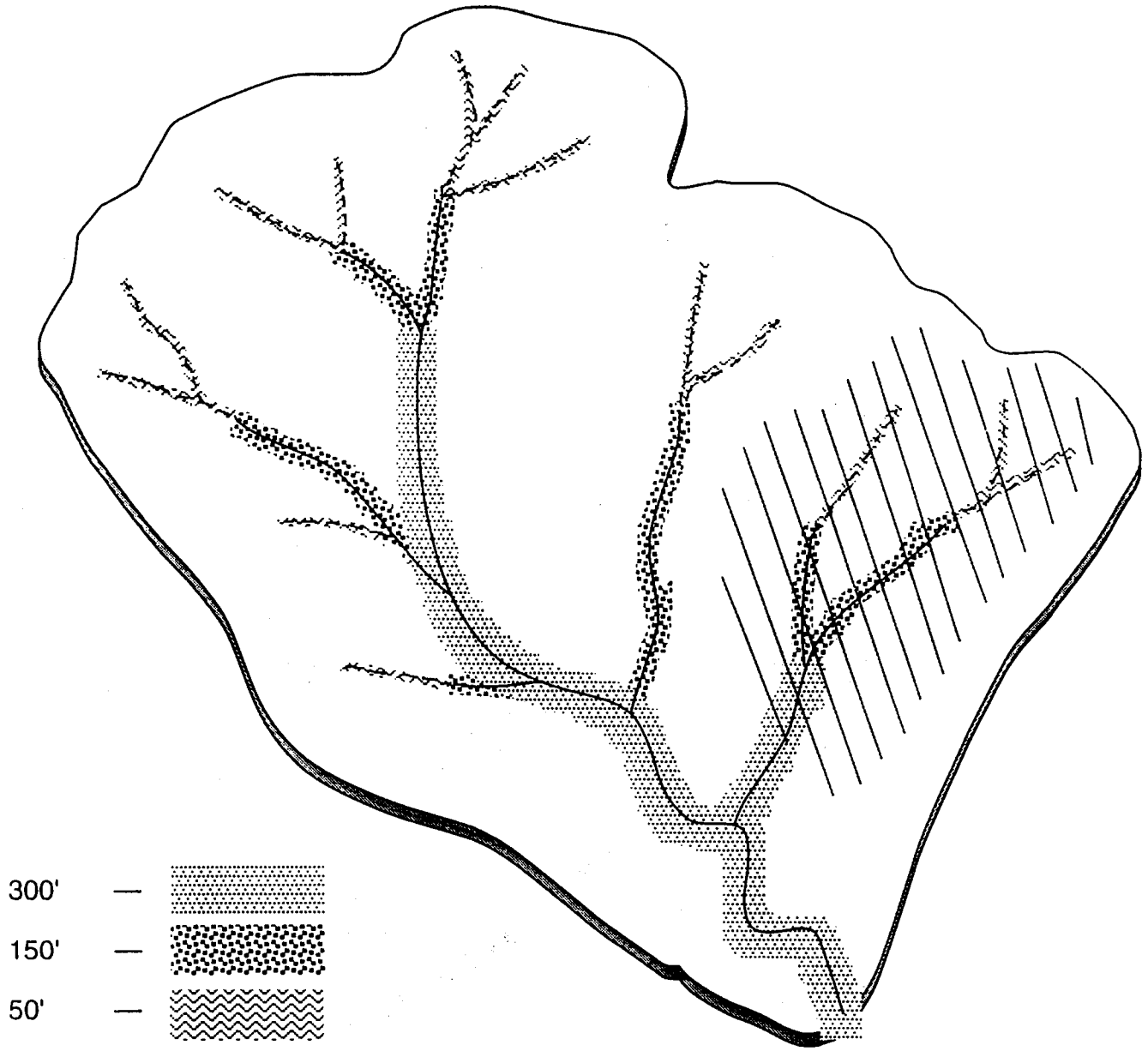

Figure 3. Schematic Delineation of Riparian Habitat Conservation Areas in Non-Key Watersheds Under Alternatives 3 and 4. Hatch area denotes landslide-prone area.

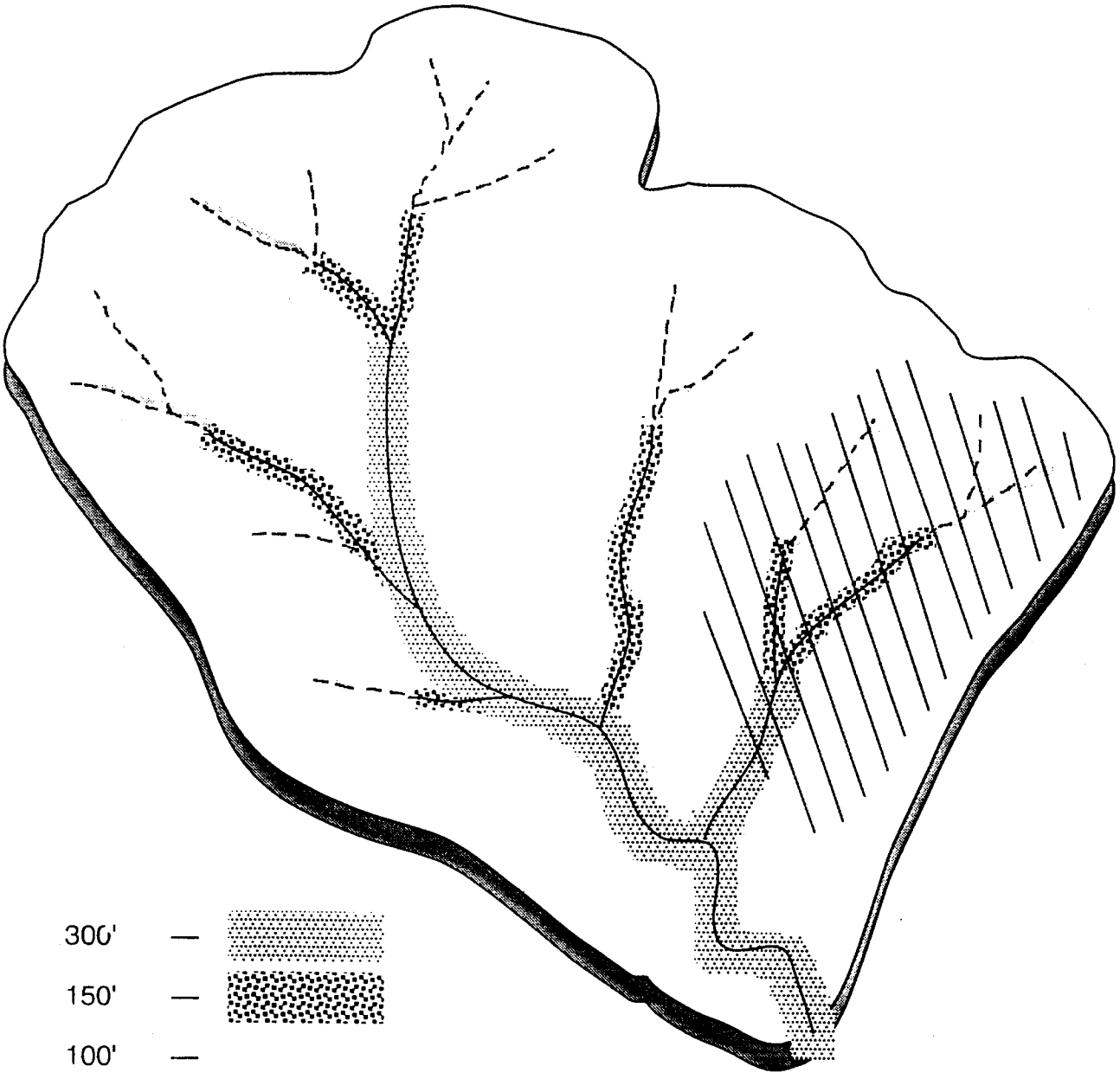

Figure 4. Schematic Delineation of Riparian Habitat Conservation Areas in Key Watersheds Under Alternatives 3 and 4, and all Watersheds Under Alternative 5. Hatch area denotes landslide-prone area.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

None of the alternatives examined in this environmental assessment would, on its own, change the physical environment. However, any subsequent proposed projects and activities that would change the environment would be subject to mitigation measures prescribed under the interim direction adopted. Such projects and activities would be carried out only after the Agencies have undertaken the appropriate level of NEPA analysis. Depending on the alternative selected, some or all ongoing projects and activities also would be subject to the mitigation measures following appropriate NEPA analysis.

To provide the decisionmaker with a means of comparing the possible effects of implementing any of the alternatives, the ID Team prepared reports on components of the environment (i.e. physical, biological, and human) that would be affected by the proposed action. The following discussion describes the direct, indirect, and cumulative effects that implementation of the alternatives would have on each component during the interim period. Virtually all of the environmental consequences disclosed in this environmental assessment are "cumulative effects," because they are the environmental and management impacts of an accumulation of management actions that would occur locally within the proposed action area. Appendix D lists those forest plans and LUPs that have been prepared for lands within the proposed action area that are under the Agencies' jurisdictions and the EISs from which those plans were developed. On a watershed-specific basis, those forest plans, LUPs, and EISs describe current riparian and aquatic environments in greater detail than is presented in this environmental assessment.

Analyses of environmental consequences are based primarily on estimates of the effects of predicted changes in livestock grazing, recreational use, and timber harvesting, as well as the road construction and reconstruction activities associated with those uses, which would result from implementation of each of the alternatives. A report of the estimated changes in these resource outputs for each alternative is included in the process records.[40] The changes were determined as follows:

The estimated effects of each alternative on timber, range, and recreation programs were based on preliminary analyses[41] conducted by field and research economists who collected data from the 15 affected national forests and 7 BLM districts. As originally conceived, the preliminary analyses considered environmental effects over a 10-year period. The economists assumed that during that time, management direction on the scope of projects and activities would be consistent with that which is described for Alternative 4, the preferred alternative in this environmental assessment. The results of the preliminary analyses were based on forest plan and LUP output projections, as well as data from current, actual outputs. A key concept of the study was the incremental change that would result from adoption of new management direction. The economists followed a 3-step process that included: (1) identification and

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[40]USDA Forest Service - USDI Bureau of Land Management. 1993. *Determination of Managed Activities Affected by Alternatives described in the Environmental Assessment for Managing Anadromous Fish-Producing Watershed on Federal Lands in Eastern Oregon and Washington, Idaho, and Portions of California.* Process paper to the ID Team.

[41]C. S. Hansen-Murray, N. A. Bolon, and R. W. Haynes. 1993. *The Estimated Impacts on the Timber Range, and Recreation Programs on National Forest and Bureau of Land Management Lands from adopting the proposed PACFISH strategy.* Draft internal report to the WO PACFISH Policy Group.

delineation of anadromous watersheds, (2) definition of interim boundaries for RHCAs, described in terms of width-in-feet for each category of stream or water body, and (3) estimated changes in management activities and output levels within the RHCAs, which would result from applying proposed standards and guidelines to achieve RMOs. Full consideration of changes in outputs will require the more site-specific analyses that will be developed, analyzed, and displayed in the separate and distinct geographical specific EISs.

Data from the preliminary analyses were used as a basis for estimating the effects, in terms of the physical outputs and the costs to the Government, of implementing Alternative 4, the preferred alternative, during the interim period. The changes in outputs described in Alternatives 2, 3, and 5, were extrapolated from data that were computed for Alternative 4 (Preferred) by an interagency, interdisciplinary technical advisory group.

All cost data in this environmental assessment are reported in 1993 dollars. Costs and effects not reported include those related to additional impacts to road and trail systems construction, reconstruction, and maintenance, minerals extraction, and water management programs, as well as costs incurred by private operators and users. More complete costs will be developed, analyzed, and displayed in economic reports prepared for and included in the geographically specific EISs.

The Agencies have participated in extensive consultation with the NMFS about listed salmon in the Snake River Basin and the effects of ongoing and proposed activities there. These consultations indicate that the greatest changes to resource outputs would be expected in timber, range, and recreation resources. Nonetheless, some minor changes in other activities--such as mining, wildlife habitat improvement, and the use of prescribed fire--also would be expected.

In analyzing the alternatives considered in detail, the ID Team assumed the following:

1. On their own, the alternatives considered will not result in any ground-disturbing activities or direct changes to the environmental status quo. The alternatives provide a range of management regimes and mitigation measures to be applied to projects and activities. The mitigation measures may result in the delay or modification of projects and activities. New project decisions will be preceded, as appropriate, by site-specific NEPA analysis.

2. Alternative 1 represents no deviation from the level and intensity of ongoing or proposed projects and activities. Conditions and trends would not change substantially, and all ongoing and proposed projects and activities would proceed, in accordance with approved forest plans and LUPs, and in compliance with Agency regulations, provisions of the ESA, and direction provided by the Congress.

3. The affected environment is the present environment. Analyses in this environmental assessment consider trends and changes associated primarily with ongoing and proposed timber harvesting, livestock grazing, and recreation uses during the interim period. Net changes to the affected environment are the basis for comparison of alternatives.

4. Environmental effects of the alternatives considered in detail are based solely on the implementation of any new strategy within the geographic scope of the proposed action. Management direction described for each alternative would apply only to lands within anadromous watersheds that are administered by the Agencies.

5. The effects of the alternatives are considered only for the interim period. Because recovery processes within riparian and aquatic habitats are gradual, short-term adjustments in management practices may not result in dramatic habitat improvement during the interim period. However, redirection of trends, shifts in rates of change, establishment of different risk factors, or changes in the time frames of ongoing or proposed projects and activities may occur. Incremental improvement in habitat condition and trends is necessary to ensure the protection or restoration of some anadromous fish stocks.

6. Any changes in environmental conditions that may result are attributable to changes in management practices within RHCAs and increased understanding of watershed condition that is gained through Watershed Analysis. The ID Team analyzed the net effect of changes in management practices, based on differences among the alternatives in the size, number, and distribution of RHCAs, as well as in the breadth of standards and guidelines, the scope of projects and activities covered, and the degree to which Watershed Analysis is conducted.

7. No Alternative Considered in Detail would require the removal or obliteration of roads or facilities during the interim period. However, closure or a reduction in use of such facilities may occur.

8. Projects and activities within the range of listed anadromous fish, and for which ESA consultation with the NMFS has been completed will be considered to be in compliance with any interim direction alternative that is selected.

9. Implementation of any interim strategy for protecting anadromous fish would not begin until analysis of the public's comment on this environmental assessment are completed, and ESA consultation provisions are met. The Agencies may need to incorporate changes based on these reviews.

Physical Environment

WATERSHED & WATER RESOURCES

Important water resource issues are related to water quality (primarily the delivery, movement, and disposition of sediment); temperature changes (extremes and fluctuations); flow regimen adjustments (flooding and low flows); stream channel conditions (including the stability characteristics of erosion and deposition); and channel morphology (structural components, width-depth ratio, bank angle). These elements often are functionally related.[42] Further, they are influenced by natural soil erosion hazards, potential and actual mass stability hazards, geomorphology, and the status of other riparian-area components including flood-prone areas, wetlands, and proximal upslope or terrestrial lands that buffer or directly influence riparian areas.

The response of water and associated aquatic and riparian resources is a function of the entire river basin and the cumulative effects of activities in the river basin. The interim standards and guidelines evaluated in this analysis apply to activities within riparian areas or RHCAs; however, their application may indirectly affect or be affected by management activities elsewhere in the watershed.

AFFECTED ENVIRONMENT

The proposed action encompasses much of the Columbia River Basin upstream and east of the Cascade Mountains in Oregon and Washington, and large areas of Idaho, as well as portions of the Sacramento, San Joaquin, and south coastal drainages in California. Below are summary descriptions of the affected areas. More complete, watershed-specific descriptions of the affected physical environment are included in the forest plans, LUPs, and EISs listed in Appendix D.

Columbia River Basin: The Columbia and its tributaries flow through several geomorphic provinces. The area within the scope of the proposed action is dominated by the intrusive granites and metasediments associated with the Idaho Batholith and Bitterroot Ranges, the extruded basalts and other igneous rocks associated with the Columbia Plateau, and various sedimentary and wind-deposited formations. Glacial actions and mountain uplift defined the morphology of most of the higher elevations. Volcanic activity influences much of the western and central basins.

Stream flow from the headwaters generally is snow-dominated. A significant snowpack accumulates from late fall through spring. Snow melt in spring and early summer results in a notable runoff surge that usually is sustained well into the summer. Water temperatures tend to be cool year-round. Generally, water quality is excellent in the headwaters.

In general, the rivers and streams are relatively steep in the headwaters, controlled by bedrock and glacially-derived formations. Falls, step-pool, and cascades are not uncommon. High mountain lakes are common in the headwaters. Relatively gentle gradient meadow reaches are frequent, but they are not dominant over most tributary lengths near the headwaters.

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[42]L.B. Leopold, M.G. Wolman, and J.P. Miller. 1964. *Fluvial Processes in Geomorphology*. W.H. Freeman and Co., San Francisco

Lower in the drainage where gradients are less, channels are not as confined, and depositional landforms dominate, the streams often exhibit meandering characteristics with lateral adjustments taking place. Wide flood-prone areas become more frequent. Channels tend toward pool-riffle-run systems.

Sacramento River Basin: The Sacramento River and its tributaries drain four geomorphic provinces: the Coast Range on the west side of the Sacramento Valley; the Siskiyou Mountains to the north and northwest; the southern Cascade volcanics on the northeastern side of the valley; and the northern Sierra Nevada mountains on the east side. The area of the proposed action--the southern Cascades--is derived from layers of quaternary and Pliocene volcanics overlaying extensions of some Sierra Nevada formations, with Mt. Shasta and Mt. Lassen being dominant terrain features. The lower reach of the Sacramento flows mostly through recent alluvium that forms the floor of the Central Valley.

Main channel flows are heavily-regulated by releases from major dams, including Folsom, Oroville, and Shasta. Most of the tributary streams are obstructed at multiple locations by dams for hydroelectric power and irrigation. In the area proposed for action Deer Creek, Mill Creek, and Antelope Creek are the last, unobstructed anadromous streams in interior California. They all drain southern Cascade volcanic formations and flow southwest, directly into the Sacramento River below Shasta Dam. Streamflows in these tributaries mostly are supplied by snowmelt, with sustaining base flows from springs and groundwater seepage. Deer, Mill, and Antelope Creeks are all young drainages, with few perennial tributaries to their main channels and without a well-developed, dendritic tributary drainage pattern.

Temperature regimes in the anadromous "transport" reaches of the Sacramento River are affected primarily by release flows from Shasta Dam and by irrigation diversions and returns. Deer, Mill, and Antelope creeks have a minor affect on the temperature of the Sacramento, compared to that of other major tributaries and to outflows from Shasta dam.

Temperatures in Deer, Mill, and Antelope creeks are dominated almost entirely by elevation. Their upper and middle reaches have cold water, flowing mostly in deeply-incised, mainstream canyons through moderate gradient reaches. Streambeds are dominated by riffles, interspersed with deep pools scoured into volcanic bedrock. Their upper reaches include a few alluvial meadows on the main channels. The lower reaches maintain somewhat warmer temperatures in similar gradient and streambed conditions, without cooling perennial tributaries. The lowest reaches have general warming though their lowest canyon and foothill sections to the valley floor and their confluences with the Sacramento River. Water quality is excellent on all three streams.

San Joaquin River Basin: The San Joaquin River drains the Sierra Nevada mountains to the east, the related Tehachapi Mountains to the south, and the Coast Range to the west. The primary source of flows is snowmelt from the high mountain snowpacks in the Sierra. Geology in the major tributaries is dominated by extensive areas of granitics, with notable areas of metavolcanic and metasedimentary bedrock. On the arid west side of the San Joaquin Valley, small ephemeral streams drain the east side of the Coast Range but rarely reach the San Joaquin River. From the wetter Sierra Nevada, west slope snowpacks supply numerous streams and three major rivers--the Merced, Tuolumne, and Stanislaus rivers. The Consumnes, Mokelumne, and Calaveras rivers are significant, smaller tributaries. The San Joaquin and its major tributaries all are obstructed by one or more large dams in their deep, middle reach canyons. Below the impoundments, the rivers' gradients are moderate, and their channels include a variety of boulder rapids and gentle pool-riffle sequences.

The anadromous, "transport" reaches of the San Joaquin River are affected by nutrient, mineral, and heat loading from agricultural return flows and by pumped import flows from the Sacramento River system. Riparian woodlands and floodplain areas have been vastly reduced by agricultural development and expanding urbanization. The San Joaquin system, which once maintained one of the largest spring-run chinook salmon fisheries on the Pacific Coast, now provides habitat for only a limited escapement of fall-run chinook salmon in the foothill regions below the tributary dams. Most of the eastern tributaries have cold flows, with good to excellent water quality.

South Coastal Drainages: Most of the coastal watersheds in central and southern California once supported substantial runs of steelhead. Coastal watersheds in central California also supported coho salmon. These runs have been reduced gradually and some may no longer be in existence. Dams, channelization, and habitat modification, combined with ground and surface water withdrawals, have limited steelhead runs.

The South Coast Drainages flow through several geomorphic provinces. The area within the range of the proposed action is dominated by metamorphic rock intermixed with various sedimentary formations and igneous rock of the Central Coast Subregion and various sedimentary formations intermixed with metamorphic and igneous rocks of the South Coast and Transverse Ranges. The bedrock of the area has been intensively folded, fractured, and faulted. Major faults in the area are considered active or potentially active. Seismic activity influences much of the morphology of the area.

Generally, stream flow from the headwaters is rainstorm-event dominated. Snow accumulates in the higher elevations but is not a significant part of the winter precipitation. Most drainages are dependant on winter rainfall and year-round springs and seeps. Generally, water quality is good, although lime cementation of the substrate, either due to natural mineral content or upstream mining operations, may cause degradation of habitat. Late summer water flows and high temperatures may become limiting in some areas. Flooding sometimes occurs along major stream courses during and following extended rains. The worst flooding results from high intensity winter rains falling on burned watersheds, increasing peak flows and enabling increased transport of sediment loads within the channel. Large deposits of sand at river mouths often form coastal lagoons and sand bars that may block fish passage during low flows. During periods when river mouths close, dissolved oxygen levels and water temperatures may stress trapped aquatic life.

In general, the rivers and streams flow through deep and relatively moderate to high gradient canyons. Bedrock outcrops, cascades, and falls historically limited fish passage in the headwaters. Deep pools separated by short, shallow glides and large-cobble/small-boulder riffles and runs, dominate the historically accessible reaches.

Lower in the drainages where gradients are less, channels are not as confined, depositional landforms dominate the streams, and stream courses often exhibit meandering characteristics with lateral adjustments taking place. Wider flood prone areas become more frequent. Channels tend toward pool-riffle-run systems.

ENVIRONMENTAL CONSEQUENCES

Past and continuing management practices are causing erosion and sedimentation in various forms and by varying degrees throughout the project area. In central Idaho, for example, where granite bedrock rapidly weathers into highly mobile, coarse sand, these phenomena are prevalent. Inadequately located, designed, and constructed roads, as well as poorly designed timber-harvest units, have provided a substantial mechanism for delivering sediments to and through major stream systems throughout the project area.

Mass erosion has been accelerated in many locations where instability is a common natural feature of the landscape. Reduction of tree root holding capacity, increases in slope subsurface water, and undercutting the toe of unstable slopes have resulted in significant sources of downstream sedimentation and local channel damage.

Local extremes in water temperature have been significantly increased by a reduction of shading from bank and other vegetation, flattening of bank angles, and reduction of overall water depth in the summer months from sedimentation as well as water diversion. Temperature effects tend to be localized in the mountainous areas, but in the lower gradient and non-timbered stream reaches, temperature change can be geographically extensive.

Channel condition and channel stability have been and continue to be affected, especially in areas of extensive or long term management. Grazing animals, road construction, logging practices, and recreational use in some areas have destabilized stream banks resulting in bank erosion, loss of cover and shading, widening and filling of channels, and accelerated lateral migration. Recently developed and implemented Best Management Practices, forest plans, and LUPs have reduced the frequency with which new stream destabilization occurs; however, existing channel condition and stability problems are not expected to be significantly corrected if present trends continue.

Channel structure, which is a natural control mechanism for maintaining water quality and the stream's ability to handle flooding and provide appropriate fish habitat, has been widely modified throughout the basin. In forested systems, habitat complexity and channel structure are created and maintained largely by the effects of large woody debris. In non-forested systems, healthy riparian communities contribute to the creation and maintenance of structure and complexity as exhibited by the presence of deep pools and undercut banks.

Logging and other associated timber management activities can affect water resources in several ways. Removal of trees and stream-side brush can reduce the complexity of habitat and channel structure by influencing the amount of large woody debris available for recruitment into stream systems. By altering stream shading, such activities can affect water temperature regimes and eliminate stream habitat cover. Removal of vegetation also can destabilize marginally stable slopes by increasing the subsurface water load, lowering root strength, and altering water flow patterns in the slope. Skid trails, logging roads, and road crossings can be direct sources of sediment to the creek and can provide direct conduits for water yield and sediment from other local sources. Roads, road crossings, and skid trails also can partially constrict or channelize flows and impede a stream's ability to maintain pools.

Grazing patterns in and around riparian areas can alter the vigor, composition, and diversity of the natural vegetation. This in turn can affect the site's ability to control erosion, provide stability to stream banks, and provide shade and cover to the stream. Mechanical compaction

can reduce the productivity of the soils appreciably and cause bank slough and erosion. Mechanical bank damage often leads to channel widening, lateral migration (channel erosion), and excess sedimentation.

Recreation sites in riparian areas attract and concentrate human use in and around stream channels. Heavy and continuous use often results in severe compaction and bank sloughing, not unlike the effects of heavy livestock use. Erosion and gully formation can follow. Bank and near-bank vegetation often is damaged and the potential for important woody riparian vegetation replacement can be compromised.

Water diversions and impoundments that alter flow regimes (ie. peaks flows, low flows, and duration of flows) directly reduce available fish habitat, and reduce the stream's ability to move sediment and woody debris, maintain its structural integrity and form, and prevent vegetative encroachment.

Alternative 1: Because this alternative is limited to providing only those protection measures provided in current plans and through NEPA and the ESA, present trends in riparian and aquatic habitat condition would be expected to continue. Modifications to projects and activities to comply with the requirements of current plans or the ESA may reduce recreation visitor days (RVDs), animal unit months (AUMs) of permitted grazing, or timber harvest. However, to the extent these reductions occur, they are independent of any decision by the Agencies regarding implementation of interim direction.

Where soil is compacted from heavy use, additional erosion and stream degradation would be expected. Localized benefits would be limited primarily to areas protected by special designation or subject to ESA Section 7 consultation.

Alternative 2: Because this alternative is limited to certain kinds of proposed projects and activities within riparian areas, expected effects on watershed and water resources would be limited and randomly dispersed over the planning area. However, modifications to proposed projects and activities would result in fewer RVDs and reduced timber harvest. The level of permitted grazing would not be affected.

This alternative would ensure that some specified kinds of proposed projects and activities within riparian areas would meet standards and guidelines that are designed to prevent further stream degradation. Those measures would be taken to contribute to the maintenance of effective habitat.

In some areas, where soils have not been compacted by heavy use, and ongoing activities are not contributing to substantial habitat degradation, revegetation would begin. Localized benefits could be large where a large number of proposed projects and activities occur within the affected riparian areas. However, it is not likely that improvements in basin-wide water resources and stream conditions would be measurable as a result of actions taken during the interim period.

Alternative 3: Because additional standards and guidelines would apply to all proposed projects and activities within RHCAs, localized risks associated with all proposed activities or activities would be reduced.

Modifications to proposed projects and activities would lead to reductions in some resource outputs. These modifications would account for fewer RVDs and a modest reduction in timber harvest. The level of permitted grazing would not be affected.

In areas where soils have not been compacted by heavy use, and ongoing activities are not contributing substantially to habitat degradation, revegetation would begin. Localized benefits could be large where a large number of proposed projects and activities are conducted within the affected RHCAs.

Although measurable improvements in basin-wide water resource and stream conditions would be unlikely, because standards and guidelines would be applied to all proposed projects and activities, and RHCAs would include more of the watershed than would be protected under Alternative 2, some additional protection of anadromous fish would occur.

Alternative 4 (PREFERRED): On a case-by-case basis, land managers would evaluate ongoing projects and activities and modify those that are determined to be causing unacceptable risk (as indicated by the magnitude, frequency, duration, and timing of the problem, the condition of the watershed, and the status of the anadromous fish stocks in the watershed). Modifications to proposed projects and activities and to some ongoing projects and activities would lead to a reduction in resource outputs. Those modifications would account for fewer RVDs, a reduction in timber harvest, and fewer AUMs of permitted grazing within certain streamside areas.

Several existing dispersed and developed recreation sites likely would be closed during the interim period. Such closures would allow some recovery in riparian areas and streams where heavy human uses have degraded riparian and aquatic habitat, although soil compaction resulting from extended use would inhibit such recovery.

Where grazing and timber harvest have caused impacts, implementation of this alternative would provide improved soil stability, additional stream shading, and continuing supplies of large woody debris to affected streams. Where grazing has contributed to unstable stream banks, loss of vegetative cover and shade, and increased sedimentation, the trend toward such habitat degradation would be slowed or reversed. This action would be expected to arrest habitat degradation and initiate recovery.

Protection measures prescribed for timber-, recreation-, and grazing-related activities, as well as other activities, would be widely dispersed throughout the area of the proposed action. Where such measures are applied, associated risks to water resources would be reduced. Where they are not applied, associated risks will be few. Risks associated with sediment loading, bank damage, loss of shade, and water temperature increases, or the loss of large woody debris from the riparian area would be substantially reduced from current and expected levels. The degree of recovery would be contingent on the extent of damage, the sensitivity of the affected site and stream channel to changes in management direction, and the availability of moisture during the interim period. Although improvements to watersheds and water resources could be noticeable at a few sites, measurable improvement in habitat condition from implementation during the interim period would not likely be substantial because recovery processes are gradual.

Alternative 5: Watershed Analyses would be required within all Key Watersheds prior to initiation of proposed projects and activities in RHCAs, and all activities within RHCAs in all watersheds would be modified to comply with new standards and guidelines. Modifications

to ongoing projects and activities would lead to a reduction in resource outputs. Those modifications would result in fewer RVDs, a reduction in timber harvest, and fewer AUMs of livestock grazing within streamside areas.

Many dispersed and developed recreation sites likely would be closed during the interim period. Such closures would allow some recovery in riparian areas and streams where heavy human uses have degraded riparian and aquatic habitat, although soil compaction resulting from extended use would inhibit such recovery.

Implementation of this alternative would provide improved soil stability, additional stream shading and continuing supplies of large woody debris to affected streams. Where grazing, timber , and other activities have contributed to unstable stream banks, loss of vegetative cover and shade, and increased sedimentation, the trend toward such habitat degradation would be slowed or reversed. This action would be expected to arrest habitat degradation and initiate recovery.

Protection measures prescribed for timber-, recreation-, and grazing-related activities, as well as other activities, would be dispersed widely throughout the area considered in this environmental assessment. Associated risks to water resources would be reduced. Risks associated with sediment loading, bank damage, loss of shade and water temperature increases, or the loss of large woody debris from the riparian area would be substantially reduced from current and expected levels. The degree of recovery would be contingent on the extent of damage, the sensitivity of the affected site and stream channel to changes in management direction, and the availability of moisture during the interim period, although measurable improvements to watersheds and water resources could be noticeable at a few sites. The overall health of affected areas and any substantial improvement in habitat conditions would occur gradually, and would not be expected to improve substantially during the interim period.

Biological Environment

NON-FORESTED VEGETATION

AFFECTED ENVIRONMENT

Non-forested uplands within the affected area consist mostly of sagebrush plant communities. Wyoming, Basin Big, and Mountain Big sagebrush are the most common species. Other common shrubs include bitterbrush, wild rose, and rabbitbrush. Typical perennial grasses are Bluebunch wheatgrass, Idaho fescue, Western wheatgrass, and Giant wild rye. Various forbs, including buckwheats, daisies, phlox, and dandelions, are common.[43] Upland sagebrush communities typically occur in areas where precipitation averages 10-18 inches per year and comes as snow or rain in the winter and spring.

Riparian vegetation in non-forested areas consists mainly of herbaceous species such as Kentucky bluegrass, although sedges, forbs, and woody species such as willow, alder, and cottonwoods are common. Vegetative cover is absent or much diminished in severely degraded riparian areas, and stream banks in such areas have been increasingly exposed to

[43]T.N. Shiflet, ed. 1994. *Rangeland Cover Types of the United States.* Soc. Range Mngmt.

severe erosion. Moderately degraded areas typically have a good cover of Kentucky bluegrass and other plant species but often are lacking in woody species. Riparian areas in good condition have a cover of sedges, a variety of different age classes of willows, alders and, in some cases, cottonwoods.

Non-forested vegetation in the Sacramento Valley is principally of four cover types. The Valley Foothill Hardwood type is comprised of various oak species (blue, valley, Engleman, interior live, coast live and canyon live oaks). The Valley riparian type has cottonwood, California sycamore, and valley oak as dominant species; with white alder, boxelder, and Oregon ash as subcanopy types. The mixed chaparral type is characterized by species which vary with precipitation, aspect, and soil type. Included are California scrub oak, chaparral oak, manzanita species, mountain mahogany, ceanothus species, and chemise.

The non-forest vegetation along the Pacific coast is represented by chaparral and oak-woodland types, with cottonwood and willows occurring in riparian zones.

More complete, watershed-specific descriptions of the affected non-forested vegetation environment are included in the forest plans, LUPs, and EISs listed in Appendix D.

ENVIRONMENTAL CONSEQUENCES

Most negative effects to riparian vegetation have been caused by excessive grazing, although excessive recreational use is important in some areas. Popular summer recreation areas, as well as areas where year-round grazing or grazing during the hot, mid-summer months occurs, have experienced degradation of riparian and aquatic habitat. Normally, changes in ecological condition resulting from a change in the percent composition of plant species do not occur in the short term. Changes in ecological condition require at least 5 years and in most cases 10 or more years.

The time frame in which measurable change can be expected is dependant on the precipitation zone and the plant community. In higher precipitation areas (where more than 12 inches of precipitation per year is common), improved management regimes in upland plant communities may effect changes in ecological condition within 5-10 years. In drier, more arid areas (where less than 10 inches of precipitation per year is common), improvement in ecological condition may take 30 years or longer. Unlike the uplands, where ecological recovery may take 5-10 years or longer, vegetative improvement in riparian areas may occur within a relatively short time, because water usually is available for plant growth during the entire growing season.

Alternative 1: Effects on non-forested uplands would continue, as modified in some areas by consultation provisions of the ESA. Uplands would not be expected to show measurable improvement in overall ecological condition, although some proposed projects or activities that are determined likely to affect listed anadromous fish species would be cancelled or modified as a result of ESA consultation. The result of consultation would be the implementation of standards, guidelines, and procedures determined by NMFS as necessary to conserve listed species and their habitat.

Due to the proximity of water and the resultant concentration of livestock and people, uplands adjacent to riparian areas, which are typically some of the most productive, have been some of the most adversely affected. In those upland areas not receiving additional protection, a

continued concentration of livestock grazing and dispersed recreational use would continue to cause degradation of upland vegetation.

Non-forested riparian areas would not be expected to show measurable improvement. Current forest plan and LUP direction would apply to all ongoing and proposed actions. The condition of riparian areas where appropriate protection measures are taken (e.g. "riparian emphasis areas" and those areas where projects and activities are subject to consultation under provisions of the ESA) would improve somewhat. But the condition of riparian and aquatic habitat not designated as riparian emphasis areas, as well as those areas for which consultation does not occur, would not be expected to improve. A downward trend may be evident in some of those areas. In other, severely degraded areas, where sloughing banks and erosion have resulted in a major loss of soil, degradation would continue.

Alternative 2: Under this alternative, specific new standards and guidelines would apply to some kinds of activities. Other proposed projects and activities and ongoing projects and activities would continue, as modified in some areas by provisions of the ESA. Uplands would not be expected to show measurable improvement in their overall ecological condition, although some projects or activities that are determined likely to affect listed fish species would be cancelled or modified as a result of consultation, and some other proposed projects would be modified as a result of the new standards and guidelines. Standards, guidelines, and procedures would apply only to some proposed projects and management activities, and not to any ongoing projects and activities.

Livestock grazing, timber harvesting, and recreational uses would continue at near-current levels. However, during the interim period some proposed projects and activities would be modified. Some incremental reduction in the risks to upland and riparian vegetation would be expected; although for the duration of the interim period the improvement in habitat conditions would be negligible.

Alternative 3: During the interim period, the effects on non-forested uplands would continue, as modified in some areas by provisions of the ESA and in all RHCAs by standards, guidelines, and procedures applied to proposed projects and management activities. These more comprehensive measures would help ensure that all new projects and activities would be developed in a manner that is responsive to new information on stock status and habitat condition. However, because ongoing projects and activities would continue under direction prescribed in current forest plans and LUPs, there would be negligible effects on much of the upland and riparian vegetation.

Livestock grazing, timber harvesting, and recreational uses would continue at near-current levels. However, during the interim period all proposed projects and activities would be subject to new standards and guidelines. Some incremental reduction in the risks to riparian vegetation would be expected, although implementation for the duration of the interim period would result in negligible improvement in habitat conditions.

Alternative 4 (PREFERRED): Under this alternative, the negative effects on non-forested uplands would be somewhat reduced, not only by modifications of proposed projects and activities, but also by the application of standards and guidelines to those ongoing projects and activities that are determined to be posing an unacceptable risk to aquatic and riparian habitat and at-risk anadromous fish stocks. This more comprehensive application of direction

would help ensure that ongoing projects and activities, as well as all new projects and activities, would be carried out in a manner that is responsive to new information on stock status and habitat condition.

Accordingly, livestock grazing, for example, would be modified if current grazing practices pose an unacceptable risk. Modification in such practices could include such things as a reduction in numbers of livestock or season of use, changes in handling practices, or the complete removal of livestock from RHCAs. Similar modifications in management of recreation and other activities would occur as needed. The amount of improvement of non-forested uplands would be dependant on the type and number of modifications implemented.

In riparian areas where current projects and activities are modified or halted, habitat conditions would be expected to improve, although the amount of improvement would depend on the extent of degradation that has occurred and the overall health of the riparian community. In some areas, the vegetative response to improved management would be expected to be measurable, and in some less degraded areas, substantial. Most vegetated riparian areas would be expected to show an increase in desirable riparian vegetation such as sedges and young willows.

With the modification or elimination, during the interim period, of projects that are determined to be causing unacceptable risk, as well as the application of protective measures in all future projects and activities, some improvement in upland and riparian habitat would be expected, and new causes of degradation would be avoided.

Alternative 5: Because standards and guidelines would apply to all ongoing projects and activities, as well as all proposed projects and activities, and larger RHCAs would be established within all watersheds, land managers would be more able to ensure that projects and activities are carried out in a manner that is responsive to new information on stock status and habitat condition.

Livestock grazing could be modified by changing permits to reduce the number of livestock or the season of use, changing handling practices that result in habitat degradation; and, in some cases, requiring the complete removal of livestock from previously permitted areas. Recreational uses, as well as other activities, also could be modified or, if necessary, reduced. The amount of improvement in non-forested uplands would be dependant on the type and number of modifications implemented.

Measures required under this alternative would further contribute to improvement of the ecological condition of all non-forested upland and riparian areas. In areas where current projects and activities are modified or halted, habitat conditions would be expected to improve, although the amount of improvement would depend on the extent of degradation that has occurred and the relative health of the upland or riparian community. In some areas the vegetative response to improved management would be expected to be measurable, and in some less degraded areas, substantial. Desirable riparian vegetation, such as sedges and willow, would be expected to increase in most affected areas.

FORESTED VEGETATION

AFFECTED ENVIRONMENT

The major forest types found in the affected areas include Fir-Spruce, Ponderosa pine, and Lodgepole pine in eastern Oregon and eastern Washington; Fir-Spruce, Ponderosa pine, Lodgepole pine, White pine, and Larch in Idaho; Fir-Spruce and Ponderosa pine in northern California; and Monterey pine, Redwood, and Valley hardwoods in southern California.[44] Although the predominant tree species are softwoods, there also are hardwoods such as aspen, cottonwood, willow, and various oaks associated with many of the foregoing forest types, as well as a wide range of understory plant species. More complete, watershed-specific descriptions of the affected forested vegetation environment are included in the forest plans, LUPs, and EISs listed in Appendix D.

Forest types that would be affected are primarily those found in Idaho, because most of the timber harvesting that would be affected by the proposed interim direction is within RHCAs in the national forests in Idaho.

Forests in the affected areas developed over time under conditions of periodic disturbance by fire (natural and human-caused), catastrophic insect and disease infestations, windstorms, and logging. In terms of tree growth rates and biomass production, the forests are very productive, particularly those areas in or near riparian systems that often are characterized by deep soils and high-moisture regimes. Forest vegetation provides habitat for many species of wildlife and is critical to ensuring the integrity of aquatic ecosystems and the life-forms they support.

The condition of forests on the affected areas varies considerably. Those forests represent a full range of successional stages, from young-growth stands to late-successional stands approaching the end of their biological life-span; often referred to as old growth. Old-growth forests range in age from 100 years for species such as aspen, to many hundreds of years for species such as for Douglas fir. The diversity of tree and other vegetative species varies considerably, on a site-by-site basis, as does the extent of canopy closure and vertical and horizontal structure. Forest health as viewed in terms of endemic tree mortality generally is a function of tree age; however, insect and disease infestations and adverse climatic condition cause mortality in both young and old forests. High mortality rates are particularly prevalent in the affected areas in eastern Oregon and are described in detail in the *Eastside Forest Ecosystem Health Assessment.*[45]

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[44]W.M. Harlow, E.S. Harrar, and F.M. White. 1979. *Textbook of Dendrology*. McGraw-Hill.
C.S. Schopmeyer. 1989. *Seeds of Woody Plants in the United States*. Ag. Handbook 450.

[45]USDA Forest Service Pacific Northwest Region. 1991. *Eastside Forest Ecosystem Health Assessment.* April 1993.

ENVIRONMENTAL CONSEQUENCES

Forest riparian areas normally constitute a strip along and adjacent to water courses, meadows, and water bodies. Timber harvesting would be permitted in some of these areas--using best management practices and in consideration of other requirements described under Alternative 1. Alternatives 2 through 5 prescribe progressively wider riparian areas or RHCAs, in which timber harvesting generally is not permitted. In general, when viewed in the context of forest-wide vegetative conditions and successional time scales, implementation of any of the 5 alternatives during the interim period would have little effect on forest vegetation.

Alternative 1: Under this alternative, implementation of forest plans and LUPs would continue. All proposed projects and management activities would undergo NEPA analyses, which would be presented for formal public review and comment.; and all proposed projects and activities that may affect listed species or adversely affect critical habitat would be subject to consultation provisions of the ESA.

The major environmental impact on forest vegetation would result from timber harvesting, which interrupts natural successional stages of stand development and reduces biomass and structural diversity. Because timber harvest would continue to the extent prescribed in current forest plans and LUPs, with modifications made necessary by consultation provisions of the ESA, implementation of this alternative would result in a continuation of the rate at which degradation of riparian and aquatic habitat is occurring. Species composition and structural diversity of forest vegetation following timber harvest is dependent, in part, on the harvest method prescribed in forest plans and LUPs and employed in affected areas. The number of living and dead trees and the amount of material that is involved, which is comprised of down woody material and other vegetation that remains on cut-over areas also depends on the harvest method selected. In general, timber harvest simulates natural events that create an early-seral stage in forest succession. Under this alternative, more overall acreage would be returned to those early stages than under the action alternatives.

Alternative 2 Under this alternative, specific new standards and guidelines regarding timber management projects and activities, logging-slash treatment and the use of prescribed fire, as well as road construction, reconstruction, and maintenance, livestock grazing, and riparian and fish habitat restoration, would apply to proposed projects and activities.

Generally, timber harvesting would not be permitted within riparian areas. The exclusion of proposed timber harvesting in the affected areas would permit the natural succession of forest vegetation and rely more heavily on natural events, such as fire and insect and disease infestations, to influence or shape forest succession. Consequently, increases in tree mortality and the associated risk of fire, insects, and disease would be expected, although less than would be expected under any of the other action alternatives, which provide more extensive protection to riparian areas. However, during the interim period the effect would be minimal.

Alternative 3 Specific new standards and guidelines regarding timber management projects and activities described under Alternative 2 would apply to all proposed projects and activities.

Timber harvesting generally would not be permitted within RHCAs. The exclusion of proposed timber harvesting in RHCAs would permit the natural succession of forest vegetation and rely more heavily on natural events, such as fire and insect and disease

infestations, to influence or shape forest succession. Consequently, tree mortality and the associated risk of fire, insects, and disease could be expected to increase somewhat from levels expected under alternative 2. However, during the interim period the effect would be minimal.

Alternative 4 (PREFERRED) Specific new standards and guidelines regarding timber management projects and activities described under Alternative 3 would apply to some ongoing projects and activities, as well as all proposed projects and activities.

Timber harvesting generally would not be permitted within RHCAs. The exclusion of proposed timber harvesting in RHCAs--and in other areas where it is determined that such activities would pose an unacceptable risk to aquatic and riparian habitat or at-risk anadromous fish--would permit the natural succession of forest vegetation and rely more heavily on natural events, such as fire and insect and disease infestations, to influence or shape such succession. Consequently, tree mortality and the associated risk of fire, insects, and disease could be expected to increase somewhat from levels expected under Alternatives 2 or 3. However, during the interim period the effect would be minimal.

Alternative 5 Specific new standards and guidelines regarding timber management projects and activities described under Alternative 3 would apply to all ongoing and proposed projects and activities.

Timber harvesting generally would not be permitted within RHCAs. The exclusion of timber harvesting would permit the natural succession of forest vegetation and rely more heavily on natural events, such as fire and insect and disease infestations, to influence or shape forest succession. Consequently, tree mortality and the associated risk of fire, insects, and disease could be expected to increase from levels expected under the other action alternatives. However, during the interim period the effect would be minimal.

FISHERY RESOURCE

AFFECTED ENVIRONMENT

Within the area considered in this environmental assessment, approximately 15 million acres of lands provide diverse riparian and aquatic habitats for a variety of fish species, including cutthroat, rainbow, brook, brown, golden, and bull trout; sockeye, chinook, coho, and chum salmon, and steelhead trout; and white sturgeon, northern squawfish, suckers, chubs, dace, shiners, sculpins, and other lesser known species.[46] More complete, watershed-specific descriptions of the affected fishery resource environment are included in the forest plans, LUPs, and EISs listed in Appendix D. Several fish species, including many salmon and trout stocks, are threatened, endangered, State-sensitive, or at risk of becoming "special status" species. Of the 214 anadromous fish identified in the AFS published report as at-risk or of special concern, 39 are from California, 58 are from the Oregon coast, 76 are from the

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[46]P.B. Moyle. 1976. *Inland Fishes of California.* Univ. CA Press, Berkley. C.E. Bond. 1973. *Keys to Oregon Freshwater Fishes.* Tech. Bull 58. OSU Ag. Exp. Sta., Corvallis. R.S. Wydoski and R.R. Whitney. 1979. *Inland Fishes of Washington.* Univ. WA Press, Seattle. J. Simpson and R. Wallace. 1978. *Fishes of Idaho.* Univ Press of ID, Moscow.

Columbia River basin in Idaho, Oregon and Washington, and 41 are from the Washington coast/Puget Sound area. Activities in areas used by those species that are threatened, endangered, proposed for listing, or sensitive are subject to ESA provisions that require consultation or special consideration. See pages 2-10 above for further description of recent studies on aquatic and riparian habitat degradation and anadromous fish population declines.

Generally, State agencies manage fish resources, although sovereign Tribes and some regulatory Federal agencies also have responsibility for management of fishery resources. The Agencies' responsibilities are focused on management of habitat that is within their jurisdictions. Close cooperation among the various other agencies, governments, and jurisdictions is necessary to ensure proper management of fishery resources.

Anadromous fish are widely distributed throughout the area and tend to thrive in streams that are characteristic of most watersheds within the area of consideration. Figure 1 shows known anadromous watersheds within the proposed area. Anadromous fish require a marine environment to complete their life cycles, and they spend varying amounts of time in the ocean during their major growth phase. Over the past 50-80 years, freshwater anadromous fish habitats have been adversely affected by human population growth and factors associated with that growth. As a result, many anadromous fish streams have been severely degraded during the last 50 years.

Generally, anadromous fish streams contain 30-70 percent fewer large, deep pools, more fine sediments in spawning gravels, and greater disturbance of riparian vegetation than is acceptable. As a result, the fish habitat capability of those streams has diminished. The number of anadromous fish returning to freshwater systems has declined substantially from the high levels recorded in years past. This decline stems from a variety of factors, including excessive ocean and freshwater harvest, habitat losses from logging, grazing, mining, recreation, and other surface-disturbing activities, genetic and disease problems associated with hatchery supplementation efforts, and problems with passage and flow associated with hydropower installations and other impoundment and diversion facilities located in critical watersheds. Future human population growth is expected to continue to increase pressures on these habitats. Management changes that work to improve habitat capability and fish populations will be necessary to ameliorate these pressures.

ENVIRONMENTAL CONSEQUENCES

Anticipated effects on anadromous fish and riparian and aquatic habitats traditionally have been estimated by the effects on representative habitats and species. By ensuring that such representative habitats and species are adequately considered, sufficient habitat quality and diversity are presumed to exist where all species using similar habitats are protected and/or restored. Implementation of alternatives presented here would serve, by varying degrees, to preserve or restore existing riparian and aquatic habitats and related aquatic resources, with special emphasis on anadromous fish habitat. To gain a crucial perspective on how best to manage riparian and aquatic habitat, it is necessary not only to focus on specific representative habitats and species, but also on those habitats' processes and functions.

Management activities can adversely affect fishery habitats and fish populations by altering riparian vegetation diversity and vigor, reducing streambank vegetation and cover, reducing streambank stability, modifying water quantity, timing, and quality, and by changing delivery of structural elements, nutrients, and sediments to the water. Livestock grazing, timber

harvest, and recreational use, with their associated road building and site development, are the most prevalent activities affecting riparian and aquatic habitats and anadromous fish populations. Application of management constraints or prescriptions serves to alleviate problems with habitat and anadromous fish populations. Improvements in habitat quality and quantity and anadromous fish population diversity and abundance can result from application of management prescriptions that produce improved riparian health and increased aquatic habitat diversity.

Alternative 1: Under this alternative, the effects of ongoing and proposed projects and activities would continue, pursuant to guidance provided in current forest plans and LUPs, and in compliance with NEPA procedures and ESA provisions. Direct, indirect, and cumulative effects to fishery resources--from grazing, timber harvesting, recreation uses, mining, and other discretionary activities--would be expected to continue at current levels.

The severity of effects on fisheries and aquatic and riparian habitat would be proportional to the level of ground-disturbing activities associated with ongoing and future activities that are permitted within riparian areas. Overall trends in habitat degradation and declines in anadromous fish populations indicate that ESA provisions may result in modifications to projects and activities, amendments to current forest plans and LUPs where anadromous fish already are listed, and the listing of additional species in the near future.

Alternative 2: Under this alternative, specific new standards and guidelines would apply to proposed livestock grazing, logging slash treatment and the use of prescribed fire, road construction and reconstruction, and riparian and fish-habitat restoration. Other proposed projects and activities, and all ongoing projects and activities, would continue, pursuant to guidance provided in current forest plans and LUPs, and in compliance with NEPA procedures and consultation provisions of the ESA.

The effects of this alternative on anadromous fish habitat would be related to the level of permitted ground-disturbing activities associated with future livestock grazing, logging slash treatment and prescribed fire, road systems, and riparian and fish habitat restoration activities within riparian areas. It would ensure these kinds of proposed projects and activities would meet standards and guidelines that are designed to prevent further stream degradation.

Because the scope of this alternative is limited to certain kinds of proposed projects and activities, expected beneficial effects on anadromous fish habitat would be limited and randomly dispersed over the planning area. Localized benefits to anadromous fish habitat could be large where large percentages of proposed projects and activities occur within affected watersheds. However, improvements in anadromous fish habitat condition are gradual, and can take decades.

Alternative 3: Because this alternative would broaden the scope of management direction to include new standards and guidelines for all proposed projects and activities within RHCAs, and because RCHAs would be established in all watersheds and would be larger in Key Watersheds, some measure of additional protection of riparian and aquatic habitat and anadromous fish would occur.

Implementation of this alternative would not result in permanently foregoing any proposed activity within the RHCAs, but some actions could be deferred or modified during the interim period, resulting in a slight, short-term beneficial effect on certain anadromous fish species.

Ongoing projects or activities would not be modified as a result of interim direction. No measurable effects on riparian or aquatic habitat would be expected, although potential benefits would include incremental improvements resulting from modifications to proposed projects and activities and from proposed riparian restoration projects. Although improved aquatic habitat condition and the attainment of RMOs eventually would be an expected result of this management direction, such benefits would not be achieved through implementation during the interim period, nor would the rate of restoration be increased substantially.

Alternative 4 (PREFERRED): Because this alternative would broaden the application of management direction by including new standards and guidelines to all proposed projects and activities and some ongoing projects and activities within RHCAs, and because large RCHAs would be established in all Key Watersheds, additional protection of riparian and aquatic habitat would occur.

Although there would be no permanent cessation of activities in RHCAs, some actions would be modified or deferred during the interim period. As a result, some adverse effects on riparian and aquatic habitats within RHCAs would be reduced. Because the restoration of riparian and aquatic habitat complexity typically occurs over a much longer time than is considered in this environmental assessment, benefits through implementation during the interim period would be expected to be negligible. However, because case-by-case reviews would be made of ongoing actions, and those actions determined to pose an unacceptable risk would be modified, some benefits to anadromous fish populations, including a reduction in risks, would be expected.

Potential benefits would include the initiation of riparian vegetative recovery that would result from a reduction in human activities and livestock use within riparian areas. Although this eventually would result in improved aquatic habitat condition and the attainment of RMOs, such benefits would not likely be apparent during the interim period.

Alternative 5: Because this alternative would broaden the scope of management direction to include new standards and guidelines for all proposed and ongoing projects and activities within RHCAs, and because large RCHAs would be established in all watersheds, additional protection of riparian and aquatic habitat would occur, and the associated risks associated with management would be reduced.

Although there would be no permanent cessation of activities in RHCAs, some actions would be modified or deferred during the interim period. As a result, some adverse effects on riparian and aquatic habitats within RHCAs would be reduced. Because the restoration of riparian and aquatic habitat complexity typically occurs over a much longer time than is considered in this environmental assessment, benefits through implementation during the interim period would be expected to be negligible. However, because large RHCAs would be established in all anadromous watersheds, and because all ongoing and proposed actions would be modified as needed to comply with the management direction, some benefits, including a reduction in risks to anadromous fish populations, would be expected.

Potential benefits would include the initiation of riparian vegetative recovery that would result from a reduction in human activities and livestock use within riparian areas. Although this eventually would result in improved aquatic habitat condition and the attainment of RMOs, such benefits would not likely be apparent through implementation during the interim period.

THREATENED, ENDANGERED AND SENSITIVE SPECIES

Numerous threatened, endangered, and sensitive plant species occur within the proposed project area (50 CFR 17.12).[47] Projects that might affect plant species listed as threatened or endangered under the Endangered Species Act are subject to consultation with the U.S. Fish and Wildlife Service. To avoid negative effects on individual plants or populations, projects sometimes are modified or, in some rare instances cancelled. Generally, plant species designated as "sensitive" by the Agencies are inventoried during project planning, so that potential impacts can be avoided or mitigated. None of the proposed alternatives would affect this direction.

A number of threatened, endangered, and sensitive terrestrial vertebrate and invertebrate species occur on lands administered by the Agencies (50 CFR 17.11). Among the federally-listed threatened and endangered species that occur within the area are bald eagle, peregrine falcon, grizzly bear, and gray wolf. More complete, watershed-specific descriptions of the affected threatened, endangered, and sensitive species environment are included in the forest plans, LUPs, and EISs listed in Appendix D.

Under the ESA, activities that may have an effect on threatened or endangered wildlife species are subject to consultation with the USFWS or the NMFS. Requirements for consultation would remain in effect under any of the interim strategies. Management of sensitive wildlife species varies by national forest or BLM district, and usually is implemented in cooperation with State wildlife agencies. On lands administrated by the Agencies, managers are directed to plan and implement projects in ways which would avoid impacts that could move a sensitive species towards Federal listing.

Changes resulting from implementing interim management direction for threatened, endangered, or sensitive species would be unlikely during the interim period; however, local, beneficial effects could result from implementation if existing or potential habitat for individual species were afforded additional protection. No detrimental impacts to threatened, endangered, or sensitive species would be anticipated as a result of implementation.

WILDLIFE

AFFECTED ENVIRONMENT

The 15 national forests and 7 BLM districts included in the proposal provide an array of wildlife habitats, ranging from the alpine meadows and mesic, old-growth coniferous forests of northern Washington and Idaho to the semi-arid sagebrush steppes, alkali flats, and volcanic formations of the Great Basin and northern California. These diverse landforms and plant communities, in turn, support an large number of species. For example, over 400 species of terrestrial vertebrates have been identified on the Okanogan National Forest (Okanogan Land and Resource Management Plan, 1989). More complete, watershed-specific descriptions of the affected wildlife environment are included in the forest plans, LUPs, and EISs listed in Appendix D.

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[47]R.J. Meinke. 1982. *Threatened and endangered vascular plants of Oregon: an illustrated guide.* U.S. Fish and Wild. Serv.

During the preparation of forest plans, indicator species were selected to represent either featured species or groups of species that respond to environmental variables in similar ways. Specific allocations and management practices were established to ensure the continued viability and sustainability of indicators and the species groups they represent. More than 30 bird, mammal, and amphibian indicator species are identified in the forest plans. Many of these species have either complex habitat requirements or are closely associated with unique or scarce habitats. Riparian habitats are critical to the viability of many species in the more arid interior portions of the West and, in general, support greater species richness and density than any other habitat type. Riparian habitats in the West are in short supply, both naturally and as a result of human manipulation, and account for less than 10 percent of the total land base considered in this environmental assessment.

Many indicator species are considered old-growth-associated or old-growth-dependent. A combination of circumstances (including steep slopes, inaccessibility and/or long fire-return intervals) have resulted in the survival of remnant old-growth stands along many streams in the inland Northwest. Although often highly fragmented, these stringers of late-successional forest still provide micro-climates and forest structure important for a variety of species; from salamanders to bald eagles to Rocky Mountain elk.

ENVIRONMENTAL CONSEQUENCES

Any of the action alternatives would have potential beneficial effects on wildlife habitats and populations, either by avoiding habitat loss, allowing incremental improvement of degraded habitat in the absence of further disturbance, providing the potential for increased reproductive success (on a site-specific basis), or simply by the retention of options for future protection under measures prescribed in the geographically specific EISs. However, the degree of benefit varies by alternative.

Alternative 1: Current forest plans and LUPs would remain in effect. Standards and guidelines within those plans call for protection of wildlife species and their habitats, as do ESA provisions. Both would govern proposed and ongoing projects and activities. No change of benefit or risk would be expected to result from project implementation.

Alternative 2: This alternative applies the aquatic and riparian components of the "watershed and fish habitat emphasis option," which were developed by the Scientific Panel on Late-Successional Forest Ecosystems, to anadromous watersheds considered in this environmental assessment. This strategy would augment reserve areas already in place for indicator species and maintain important refugia for other species, including big-game hiding cover.

Because the construction of new roads would be minimized, habitat effectiveness and reduced stresses on big-game species would increase, particularly during hunting seasons.

Because restrictions on livestock grazing, timber management, logging slash treatment and prescribed fire, road systems construction and reconstruction, and riparian and fish-habitat restoration would apply to proposed projects and activities only, substantial improvements in riparian wildlife habitats would not be expected during the interim period.

Alternative 3: Standards, guidelines, and procedures for riparian habitat conservation would apply to all proposed projects and activities. Such measures would contribute to the protection of wildlife species and their habitats, although the effects of implementation during the interim period would likely not be measurable.

Alternative 4 (PREFERRED): Standards, guidelines, and procedures for riparian habitat conservation would apply to all proposed projects and activities and those ongoing projects or activities that are determined to pose unacceptable risk to aquatic and riparian habitat or at-risk fish species. Because RCHAs would be designated within all watersheds, and larger RHCAs would be established in Key Watersheds, the distribution and size of those areas would contribute to the protection of wildlife species and their habitats. However, during the interim period the effects of implementation likely would not be measurable.

Changes to livestock grazing programs, although representing only about 4 percent of current AUMs, are within RHCAs. Generally, this small decrease would have very little effect on wildlife habitat, except perhaps within those specific local project areas where unacceptable impacts are occurring. Some benefits to habitats and populations would result from road closures, but overall beneficial effects would be expected to be small.

Alternative 5: Standards, guidelines, and procedures for riparian habitat conservation would apply to all proposed projects and activities, as well as all ongoing projects or activities. Because large RCHAs would be designated within all watersheds, the distribution and size of those areas would contribute to the protection of wildlife species and their habitats. However the effects of implementation during the interim likely would not be measurable.

Changes to livestock grazing programs, although representing only about 8-10 percent of the total AUMs, would be within RHCAs. Generally, this small decrease would have very little effect on wildlife habitat, except perhaps within those specific local project areas where unacceptable impacts are occurring. Some benefits to habitats and populations would result from road closures, but overall beneficial effects would be expected to be small.

SOCIAL

SOCIAL VALUES

A wide range of social values are assigned to the resources administered by the Agencies. More complete, watershed-specific descriptions of these values are included in the forest plans, LUPs, and EISs listed in Appendix D.

Hoover (1993)[48] has provided an overview of non-economic values that are assigned to anadromous fish in the Pacific Northwest--by both native and non-native peoples. Symbolic values, cultural and spiritual values, subsistence uses, and psychological and social benefits describe some of the importance that people assign to those species.

In an attempt to prevent further degradation of anadromous fish habitat and declines in fish populations, the Agencies also are seeking an appropriate means of preventing losses in the social, cultural, and psychological investment that people have made in anadromous fish.

However, during the interim period, implementation of any of the alternatives likely would have no direct or immediate effect on any human values associated with anadromous fish. Such effects would be brought about by the presence or absence of fish. Changes in management practices affect habitat conditions only gradually, and changes in habitat conditions, whether positive or negative, bring about changes in fish populations only over a period of years. For this reason, the best available information suggests that implementation of any of the alternatives considered in this environmental assessment would be of little consequence during the interim period. Perhaps the greatest effect that implementation of an interim strategy would have on those people and communities that value anadromous fish would be associated with the perception that action was being taken to protect a valued resource.

Others in the Pacific Northwest feel that their lifestyle and economic stability are threatened by actions such as are proposed in this environmental assessment, as well as a variety of other pending Federal actions--such as Rangeland Reform, President Clinton's forest plan, and provisions of the Endangered Species Act. Some local communities and individuals believe that recent changes in natural resource management on Federal lands are designed to remove users and to redefine the relationship between Federal land management agencies and traditional user groups.

A variety of factors contribute to social stress and disruption, but perhaps none is so pervasive as the prospect of unprecedented change. Involuntary changes in lifestyle, impending threats to independence and financial stability, and direct confrontation with values and motives other than our own--often lead to stasis and social uncertainty. The prospects seem unequivocal:

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[48]A.P. Hoover. 1993. Non-economic values of Pacific salmon and steelhead: U.S. Forest Service Pacific salmon and steelhead habitat management strategy. Paper prepared for the PACFISH Washington Office Working Group. Policy Analysis Staff.

job losses, a kind of Federal management that would seem to be taking away the availability of predictable volumes of raw materials and our open access to public lands and resources, for the possible protection of species other than our own.

Effects that the interim strategies considered in this environmental assessment would have on the human community would vary, depending on the Agencies' capacity to adapt to internal and external forces, as well as the consequences of implementing any of them. A community's capacity to adapt to such forces depends on its ability to pursue collective goals, the skills, experience, and educational levels of people in the community; the size and diversity of local businesses; and access to financial capital, transportation, markets, and raw materials.

Generally, small, isolated communities are more vulnerable to external forces due to their less active leadership, weaker links to centers of political and economic influence, lower levels of economic diversity, and lack of control over resources and capital. Small communities are more likely to experience unemployment, increased poverty, and social disruption in the face of shifts in natural resource management policy.

The social effects of implementing any of the alternatives would be manifested in a variety of ways. Because the amount of real change in resource use during the interim period would be relatively small, it is not anticipated that implementation of any of the alternatives would have substantial positive or negative social implications. Further, any social effects would differ from individual to individual and community to community.

CULTURAL RESOURCES

Watershed-specific descriptions of the cultural resources (e.g. archaeological and historical sites) within the proposed action area are included in the forest plans, LUPs, and EISs listed in Appendix D. Effects to cultural resource sites include direct, indirect, and cumulative impacts that would result from either intentional or inadvertent damage to those sites. In general, such effects would be the result of ground-disturbing activities in the vicinity of cultural resources. Such activities are constrained by forest plan and LUP standards and guidelines. Surveys for archaeological resources are accomplished prior to approval of ground-disturbing projects and activities. However, there is a potential for effects on this resource when ground-disturbing projects and activities are implemented. The action alternatives, by varying degrees, would provide additional, incremental protection to cultural resources in riparian and associated upland areas, depending on the application of standards and guidelines and the size of riparian areas or RHCAs in which they are applied. However, during the interim period, no alternative would be expected to substantially threaten or benefit cultural resources. Alternatives 2 and 3 would provide some additional measure of protection to cultural resources by applying additional standards, guidelines, and procedures to proposed projects and activities. Alternative 4 (Preferred) would increase the benefits by also applying these provisions to some ongoing activities. Alternative 5 would offer the most additional protection by applying management direction to all proposed and ongoing projects and activities, and by establishing large RHCAs within all anadromous watersheds on lands administered by the Agencies.

WILD AND SCENIC RIVERS

Watershed-specific descriptions of the Wild and Scenic Rivers System within the proposed action area are included in the forest plans, LUPs, and EISs listed in Appendix D. Waters included in, or determined eligible for inclusion in, the National Wild and Scenic Rivers System are governed by legislation, regulations, and management plans designed to achieve goals and objectives similar to those considered in Alternatives 2-5. Anadromous fish typically are considered to be "outstandingly remarkable" features of waters in the System. Wild and Scenic River corridors always are wholly included within the definition of riparian areas described in Alternative 2, and of RHCAs described in Alternatives 3-5. Therefore, implementation of any alternative would have essentially no direct effect on the condition or response of Wild and Scenic Rivers. Indirect and cumulative effects also would be negligible.

INDIAN TRIBES

Indian Tribal governments in Oregon, Washington, and Idaho have interests in the planning area (see Table 2). Several of these governments have reserved certain off-reservation rights involving resources on Federal lands managed by the Agencies; the Klamath maintains rights in former reservation lands. All of the Tribal governments maintain interests in the management of Federal lands and resources, beyond the scope of treaty-reserved rights, which include protection of sacred areas, burial locations, and archaeological sites, as well as the perpetuation of traditional practices. Further description of the affected Indian Tribes are included in the forest plans, LUPs, and EISs listed in Appendix D.

Treaties negotiated in Oregon and Washington between 1851 and 1855 enumerated a variety of specific reserved rights in addition to the reservation of lands as homes for the tribes. Treaties of the Warm Springs, Umatilla, Nez Perce, and Yakama reserve fishing, hunting, gathering of roots and berries, pasturing horses and cattle, and erecting temporary buildings for curing fish as off-reservation rights. More specific to fishing, the Warm Springs and Umatilla treaties state as follows:

> "Provided also, that the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations in common with citizens of the United States, and of erecting suitable buildings for curing the same."

The Yakama and Nez Perce treaties include slight variations of the language. The scope and extent of fishing at "usual and accustomed places in common with citizens" have been defined through numerous court decisions. Exclusive rights to certain resources are limited to reservations, whereas rights off-reservation are to be shared with non-Indians. One primary intent of the treaties was to provide right of access to the tribes' resources and a certain share of those resources. The Shoshone-Bannock treaty only addresses off-reservation hunting, but has been held by the Supreme Court of Idaho to include the right to fish as well as the right to hunt.

Even though the Klamath Tribes were terminated in 1964, the courts have held that the Tribes retained hunting, fishing, and trapping rights on former reservation lands still in public ownership (the Winema National Forest). The Tribes was restored to Federal recognition in 1986.

The courts, Federal legislation, and policy of the Department of Interior recognize that Federal land managing agencies have a continuing trust responsibility to honor the terms of the treaties and to protect the rights of Indian governments, as well as the resources subject to those rights. In addition, a number of laws, court decisions, and executive orders have increasingly sustained the rights of Tribal governments upon public resources. There is an obligation and a responsibility of Federal agencies to consult, cooperate and coordinate resource management programs and activities upon public lands with adjacent or reserved treaty right Indian tribes.

The five alternatives offer increasingly protective management strategies for trust resources, with Alternative 5 being most protective. Perpetuation of the ability to exercise treaty rights is legally guaranteed under all alternatives, but Alternatives 3-5 offer greater flexibility in the exercise of those rights and the conducting of other traditional practices on Federal lands. The sections addressing water quality and water resources, fisheries, plants, riparian areas, and wildlife address the impacts more specifically.

Other Tribal heritage concerns, including protection of archaeological sites and locations of religious importance, are considered in the cultural resources and social values sections.

Table 2 - Tribal Governments Affected by Proposed Interim Direction

Pacific Northwest Tribal Governments

+ Confederated Tribes of the Warm Springs Reservation, *Treaty of Middle Oregon*, 1855. (12 Stat 963)
+ The Klamath Tribes, *Klamath Treaty of 1864* (16 Stat 707)
+ Confederated Tribes of the Umatilla Indian Reservation, *Walla-Walla, Cayuse Treaty of 1855*. (12 Stat 945)
+ Nez Perce Tribe, *Nez Perce Treaty of 1855* (12 Stat 957)
+ Yakama Nation, *Yakama Treaty of 1855* (12 Stat 951)
+ Confederated Salish and Kootenai Tribes of the Flathead Reservation, *Treaty with the Flatheads of 1855* (12 Stat 975)
+ NW band of Shoshone Nationas and Shoshone-Bannock Tribes of the Fort Hall Reservation, *Treaty with the Eastern Band Shoshoni and Bannock of 1868*

Colville Confederated Tribes, Executive Order of April 9, 1872
Spokane Tribe, Executive Order of March 23, 1914
Kalispel Tribe, Executive Order of March 23, 1914
Burns Paiute Tribe, Executive Order of 1897
Coure D'Alene Tribe, Executive Order of November 8, 1873
Kutenai of Bonners Ferry, Executive Order of March 8, 1859

California Tribal Governments

Alturas Rancheria (Pit River Tribe), Act of June 21, 1906 (34 Stat 325-333)
Big Bend Rancheria (Pit River Tribe), Act of June 21, 1906
Big Lagoon (Yurok-Tolowa Tribes), Restored December 15, 1983
Colusa Rancheria (Wintun), Secretarial action. June 21, 1907
+ Greenville Rancheria (Maidu), Restored December 22, 1983
+ Grindstone Creek Rancheria (Nomalaki-Wintu-Wailaki-Nuimok), Act of June 21, 1906
+ Jackson Rancheria (Miwok), Act of March 3, 1893
+ Lookout Rancheria (Miwok) Act of June 21, 1906
+ Montgomery Creek Rancheria (Madesi Band of Pit River), Act of June 30, 1913
+ Mooretown Rancheria (Maidu), restored December 22, 1983
+ Pit River Tribe of California
+ Redding Rancheria (Wintu/Pit River), restored December 15, 1983

Roaring Creek Rancheria (Pit River Tribes), Act of August 31, 1915
Covelo Indian Community (Yuki/Pit River/Achomawi/Pomo/Konkow/Wylacki/Nomalaki/Wintun), Act of April 8, 1864
Rumsey Rancheria (Wintun), Act of 1907
Sheep Ranch (Miwok), established April 5, 1916
Shingle Springs Rancheria (Miwok), established December 16, 1916
Susanville Rancheria (Paiute, Maidu, Pit River, Achomawi, Atsugewi, Washoe), established August 15, 1923
Twolumne Rancheria (Miwok, Yokut), Act of June 21, 1906
Chico Rancheria (Wailaki and Maidu)
Guidiville Rancheria (Northern Pomo)
Lytton Rancheria (Pomo)
Scotts Valley Rancheria (Northern Pomo)

+ Tribes with off-reservation treaty rights

ECONOMIC

The economic effects analysis presents, by alternative, information about impacts to resources that would be expected to result from interim direction as it applies to timber, range, and recreation programs. Estimated effects on physical output levels and budget costs to the Agencies that would result from interim direction are reported by alternative. Further consideration of changes in outputs and costs to the Agencies will be developed, analyzed, and displayed in more complete economic studies, which will be prepared for the geographically specific EISs.

An essential concept used to conduct the economic analysis is incremental change. The resource impacts presented are estimates attributable only to the adoption of interim direction. Decisions already made and actions already taken--to provide some degree of protection to aquatic and riparian ecosystems and anadromous fish habitat, are part of the baseline for assessing the economic effects of interim direction. Those prior decisions and actions already are in place and will continue to have their effect, regardless of whether interim direction is adopted. The focus of the economic effects discussion in this environmental assessment is to identify the additional or incremental effects that may be expected as a result of interim direction. Because of ESA requirements and the presence of listed anadromous fish stocks, both Agencies' field units in the Snake River Basin generally are operating under more stringent management requirements than are called for under current forest plans or LUPs. These units already have experienced reductions in many activities and output levels as a result of consultation and other ESA provisions. This environmental assessment examines the incremental economic effects that can be expected, over and above those brought about by actions that will proceed regardless of interim direction.

With a proposal of this nature, there are two main categories of economic interest to be discussed. The first category is concerned with changes in economic value to society, as reflected by changes in actual revenue and cash flows, and by changes in economic values to individuals, which are not reflected in market prices. Such non-market values include changes in levels of economic activity (employment and income) that are associated with potential changes in management actions. More complete descriptions of the affected economic environment (including economic values and economic activity) are included in the forest plans, LUPs, and EISs listed in Appendix D.

The alternatives analyzed in this document include management and mitigation measures that might affect the way National Forest System and BLM lands are used. As a result, implementation of any alternative would in some way affect the associated production of consumer goods and services from those lands. Effects on environmental goods and services, such as healthy and abundant anadromous fish populations and clean water, are considered in previous discussions of the effects on the physical and biological environment. Consumer goods and services may be marketed directly, as is the case with timber sales; or they may provide aesthetic benefits that cannot be purchased directly, e.g., river floating or driving for pleasure. Others may be subject to charges that are set administratively, e.g., livestock grazing on public lands and camping on developed sites, in which cases the economic value of the goods or services is determined by free-market forces.

The alternatives also would have direct budget costs associated with them. These costs are economically relevant, but are discussed under Agency Effects.

The geographic area described in this environmental assessment includes large parts of 4 States, and is economically complex. There are substantial amounts of timber, forage, recreation, water, fish, wildlife, minerals, and other resources or resource uses provided from national forest and BLM lands in the area under consideration. The economic value associated with these resources uses is substantial. State and private lands provide additional amounts of many of those resources and resource uses, but those uses are not addressed in this document because the management direction applies only to lands administered by the Agencies.

The total geographic area also encompasses many cities, towns, and rural populated areas. Each of these population centers or areas has its own economic structure, which is integrated with a wider subregional economy, which, in turn, is part of an even larger regional economy, All are affected by State, national, and international economic activity and events to a greater or lesser degree.

ECONOMIC VALUES

The Agencies used preliminary analyses conducted by field and research economists[49] and modified for the purposes of this environmental analysis,[50] to assess potential effects of the proposed alternatives on market and non-market economic values. The available information relates primarily to expected changes over the interim period in outputs of timber, use of grazing lands, and recreation use on the national forests and BLM Districts. Some information also is available regarding changes in mineral exploration and development activities. The estimated resource changes displayed in Table 3 focus on timber, range, and recreation activities because the greatest impacts during the interim period would be expected there. Impacts from mineral exploration and development activities, development of small hydroelectric sites, or new road or trail construction would not be expected to be substantial during the interim period. Long-term resource impacts will be examined in detail in the geographically specific EISs.

Some indication of the estimated direct revenue and nonmarket economic values associated with the timber, range, and recreation programs is possible. These figures do not constitute the basis for an economic analysis in the classical sense of the term. Rather, they are broad indicators of the magnitude of economic value changes that may be expected over the interim period. Another measure of economic value change is based on resource prices that include consumer surplus, ie., the amount over and above the going market rates that people indicate they would pay to continue using the resource. There are other economic benefits and values that will be experienced in the longer term if anadromous fish habitat degradation and the decline of anadromous fish populations is slowed, stopped, and reversed. These values would include increased recreational fishing opportunities, success rates, and quality of experience; increased fish availablity for commercial and subsistence fisheries; and increased existence and option values (passive-use values) for people who would not necessarily use the fisheries directly, but value the fact that they exist and would exist in a healthier state.

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[49]Report by C.S. Hansen-Murray, N.A. Bolon, and R.W. Haynes, cited in footnote 26.

[50]Process paper cited in footnote 25.

There are also other economic direct and opportunity costs that may be experienced in the interim period that were not measured or available. These could include such things as higher costs of operation of minerals development, and operation and slowdowns or downsizing of hydroelectric development projects. A major cost area not analyzed for this environmental assessment is that of road closures and the probable effects on various resource activities and uses. These costs will be examined in the geographically specific EISs.

Table 3. Comparison of Changes in Resource Yields by Alternative.

Alternative	Recreation Use (M RVDs)	Timber Harvested (MMBF)	Animals Grazed (M AUMs)
1	0	0	0
2	-710.4	-16	0
3	-789.3	-21	0
4	-789.3	-58	-42.1
5	-868.2	-72	-84.2

The changes in resource outputs and associated market and non-market economic values for timber, range, and recreation resources are discussed below.

Effects on Timber Harvesting: The timber harvest change estimate reflects the number of timber sales that would be partly or totally cancelled during the interim period. Only the Clearwater, Nez Perce, and the Malheur National Forests, and the BLM Coeur d'Alene District reported expected cancellation of timber sale volumes; of that total, about 90 percent would be from the Clearwater. It is expected that less than 2 percent of the affected sales would be on BLM-administered lands. Timber yields would be reduced by 16 million board feet (mmbf) under Alternative 2, by 21 mmbf under Alternative 3, 58 mmbf under Alternative 4, and by 72 mmbf under Alternative 5. In addition, up to 50 miles of road construction and reconstruction would be affected.

Recent timber price calculations made for the upcoming Resources Program and Assessment (RPA) updates indicate that stumpage values foregone (which reflect gross revenues) would be about $0.6 million under Alternative 2 and increase to about $3.9 million under Alternative 5 (in 1993 dollars). Recent analysis of timber prices[51] also indicates there is about a 20 percent increment of consumer surplus value on timber prices, compared with straight stumpage values. Timber values foregone, including consumer surplus, would be about $0.8 million under Alternative 2 and increase to about $5 million under Alternative 5 (in 1993 dollars).

Effects on Range Resources: Alternatives 1-3 would not require adjusting ongoing livestock grazing activities. Therefore, no changes in grazing use during the interim period, as measured in AUMs (animal unit months), would be expected. The changes in grazing use under Alternatives 4 and 5 would be spread across 13 of the 21 national forests and BLM districts and would occur on the defined riparian areas. Individual unit changes range from under 5 percent to over 30 percent. For the entire grazing program in anadromous watersheds across all units considered in this environmental assessment, estimated changes would range from 6-12 percent decreases. This translates to decreases of 42.1 thousand AUMs under Alternative 4, and 84.2 thousand AUMs under Alternative 5. Approximately 9 percent of the estimated reduction in AUMs is anticipated to occur on BLM-administered lands.

Fee income from grazing use that would be foregone would be $0 for Alternatives 1-3, and from about $90 thousand under Alternative 4 (Preferred) to about $180 thousand under Alternative 5 (in 1993 dollars). Grazing fees are set by administrative formula and are significantly below comparable private market values. The "fair market rental values" are estimated to be 2-3 times higher than the administrative price. There are not good consumer surplus studies for range values, although a study using linear programming and ranch budgeting showed shadow prices of forage ranging between $5 and $10 per AUM for the geographic area considered in this environmental assessment. "Fair market values" from grazing use that would be foregone would be $0 under Alternatives 1-3, about $230 thousand under Alternative 4 (Preferred), and about $460 thousand under Alternative 5 (in 1993 dollars).

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[51]R.W. Haynes. 1993. *Personal Communication*. Forestry Sciences Laboratory, PNW, Portland.

Effects on Recreation Resources: Changes in recreation use would be concentrated along rivers and streams. Areas most affected would be developed and dispersed camping, boating and floating, and fishing. Changes would come from seasonal closures or permanent closures necessary to meet the proposed alternative standards and guidelines and riparian management objectives.

Almost 85 percent of the estimated change in recreation use during the interim period would be on the Wallowa-Whitman, Los Padres, and Boise National Forests. The balance of the expected changes would occur on the Prineville BLM District and the Clearwater and Malheur National Forests. About 9 percent of the estimated reduction in recreation use would occur on BLM-administered lands. Individual unit changes would range from under 5 percent to over 30 percent. For recreation use in anadromous watersheds across all units covered by the proposed action, the estimated changes range between 5 percent and 6 percent. This translates to 710.4 thousand RVDs under Alternative 2, 789.3 thousand RVDs under Alternatives 3 and 4, and 868.2 thousand RVDs under Alternative 5.

As suggested by these figures, there would be little expected difference among the alternatives during the interim period. Alternative 2 would provide for somewhat less stringent consideration of recreation uses in the anadromous watersheds. Alternative 5 would extend more protection to intermittent streams and small wetlands. This would result in a somewhat greater effect, primarily on dispersed camping uses in those areas.

Sufficient data were not available to determine expected revenues foregone from developed campground use that would not be allowed during the interim period. Recreation values are represented primarily by consumer surplus, because only a small part is paid as fee-for-use, typically in developed facility settings. They are predominantly "non-market" values. Recreation values foregone, based on consumer surplus estimates, are around $12 thousand under Alternative 2, about $14 thousand under Alternatives 3 and 4, and up to just over $15 thousand for Alternative 5 (all in 1993 dollars) during the interim period.

ECONOMIC IMPACTS ON EMPLOYMENT

Impacts on employment are very difficult to estimate with any degree of confidence because of the short duration of this proposed action, the scope of analysis, the widely varied economies (both in size and in complexity), and the relative concentration of estimated effects in certain geographic areas. The employment multipliers or "response coefficients" developed during earlier planning efforts are generally based on input-output models. These models provided estimates of direct, indirect, and induced employment changes. In reality, such changes generally take place over a period of several years, as the changes in economic activity work their way through the economy. Therefore, they are likely to overstate the effects for an 18-month time frame. The response coefficients also were developed for areas of local economic influence, and are not technically additive with others over this much larger geographic area.

However, it is possible to give an indication of the relative magnitudes of what might be expected from implementation of the alternatives considered in detail, both by alternative and by resource area. Employment response coefficients (again, including direct, indirect, and induced employment) for timber-stumpage sales average in the neighborhood of 10 jobs per mmbf of timber harvested, expressed on a basis of annual jobs. Range coefficients appear to be between 0.3 and 0.6 total jobs per thousand AUMs grazed. Recreation coefficients vary

widely, with developed recreation providing more total jobs per thousand RVDs than dispersed motorized or dispersed nonmotorized recreation. Generally, the more equipment, food, lodging, etc,. associated with a recreation activity (e.g., developed camping, hunting, skiing), the larger the associated employment factor. Sample response coefficients for recreation range from around 1 job per thousand RVDs for dispersed, nonmotorized recreation, to around 6 jobs for developed, equipment-intensive recreation. Again, these figures are highly dependent on the structure, size, and diversity of the local economy.

Given the above discussion, and looking at the various resource outputs reported by alternative, one can conclude that over the entire geographical area the magnitude of jobs affected on an annual basis would probably be in the low tens for range, the low hundreds for timber, and the high thousands for recreation.

AGENCY EFFECTS

The best available information indicates that implementation of Alternative 5 could cost the Agencies up to $54 million. However, neither Agency has direct experience conducting the new, more rigorous Watershed Analyses included under some of the alternatives. In addition, different levels of technical skills, inventory completeness, and monitoring capability exists between the Agencies as well as among the 15 National Forests and 7 BLM Districts. Finally, no funds have been budgeted specifically for implementation of interim direction. It was assumed that, for the interim period, funds largely would need to be redirected from within current funding levels regardless of which alternative is implemented. However, new funds probably would be required to fully implement the more costly alternatives (Table 4). The range of costs varies from no additional costs under Alternative 1 to about $54 million under the most expensive alternative (Alternative 5). These costs break out in the following three categories:

Watershed Analysis - Up to $20.0 million. For simplicity, costs to complete inventories and conduct supplemental training were included as analysis costs. Monitoring was estimated as a separate category of cost, although a portion of those costs relates directly to the conduct of Watershed Analysis. The BLM makes up about 40 percent of total Watershed Analysis costs, despite managing about 12 percent of the anadromous watershed acreage covered by the proposed interim direction. The BLM estimates represent the full costs estimated to conduct Watershed Analysis, including substantial inventory work, which is not funded within current budget levels. Because some of the activities necessary to conduct Watershed Analysis already are funded in current FS budgets, the FS estimates represent only a 30 percent incremental increase over current funding levels. Without actual experience conducting the more rigorous Watershed Analyses anticipated, these preliminary cost estimates could be substantially over- or understated.

To estimate the costs of implementing Watershed Analysis under Alternatives 3 and 4, costs were calculated as 5 percent and 10 percent, respectively, of the $20 million estimated for Alternative 5. Additional funds of $1.5 million were added to the estimate for Alternative 4 (Preferred), based on the assumption that analyses of all ongoing projects and activities would need to be conducted for all watersheds to identify projects with unacceptable levels of risk. Watershed Analysis would be optional under Alternative 3, and under Alternative 2 costs would be incurred only for roads inventory and analysis on a limited number of new projects.

Monitoring - Up to $25 million. Complete monitoring costs have not been developed by either Agency. However, given historical underfunding of this activity, and based on current levels of investment for managing timber, recreation, and range resources, a surrogate 15 percent increase was calculated to cover additional monitoring activities. This estimate assumes that much of the programmatic monitoring would be covered under ongoing program budgets. The increase represents the increment associated with implementation of interim direction, 80 percent of which would be incurred by the FS. Under Alternatives 3 and 4, costs were estimated at 20 percent and 40 percent, respectively, of Alternative 5. Alternatives 1and 2 would incur no additional monitoring costs.

Program Management - Up to $9 million. Almost 80 percent of these costs would be incurred by the FS. These costs may be significantly overstated for the interim period. They were derived from preliminary estimates developed for multiple-year implementation of Alternative 4 (Preferred) and, therefore, contain costs associated with mitigation of effects on timber, range, and recreation program resources that would not be anticipated during the interim period. For instance, the livestock-grazing component of the above figure is overstated due to the assumed cost of fencing that would be necessary to restrict livestock access to riparian zones. During the interim period, however, livestock may be kept off the range to avoid the additional cost of fence building. Annual costs, appropriately included as costs that would be incurred during the interim period, include additional program administration, enforcement, and educational expenses. Site and facility modification, or reconstruction, and other mitigation costs would not be incurred to a significant extent during the interim period. Estimates of costs under Alternatives 2 and 3 were reduced from Alternative 4 (Preferred) by 25 percent each and increased 25 percent under Alternative 5. The previous Economic Values section discusses changes in resource outputs in more detail.

Research - Not estimated. In keeping with approximate amounts that have been budgeted to implement the President's plan, it was assumed that funds would need to be redirected toward applied research on ecosystem management. It was not clear whether new funds would be required or if existing funds would be "reprogrammed" from current projects. For the interim period, the investment could probably be less than $2 million. The level of investment would probably not differ substantially among the alternatives.

Table 4. Comparison of Incremental Costs to Implement Alternatives (Dollars in Millions)

Alternative	1	2	3	4	5
Watershed Analysis	0	0.5	1.0	3.5	20.0
Monitoring	0	0	5.0	10.0	25.0
Program Management	0	4.0	5.0	7.0	9.0
TOTAL	0	4.5	11.0	20.5	54.0

CONSULTATION WITH OTHERS

The Agencies' public involvement efforts began with a series of briefings for Members of the House and Senate, Federal and State agency officials, Tribal governments, and a variety of other organizations. Written input was received from Members of Congress, and from others for whom briefings were held and from those not briefed. The briefings held and letters of comment received are listed in Appendix E.

Such initial public involvement is consistent with guidance issued by the Council on Environmental Quality. Summaries of these meetings, letters, and other information relative to the Agencies' public involvement efforts are documented in the process records.

The process of determining appropriate direction is far from finished. Consultation with the NMFS and USFWS on the preferred interim strategy will be conducted, and comments from the public are encouraged. In particular, the Agencies are making this document available for public comment to facilitate broad scientific review of the direction being considered for the interim period.

The public also will be involved in the development of the longer-term strategy and future forest plan and LUP amendments. Additional administrative appeal opportunities will be available. The public is encouraged to provide any information they feel is relevant to the consideration of interim direction and the development of future plan amendments.

GLOSSARY

The Agencies - U.S. Department of Interior Bureau of Land Management and U.S. Department of Agriculture Forest Service

Anadromous Fish - Fish that are spawned and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. For purposes of this Environmental Assessment, "anadromous fish" refers to Pacific salmon, steelhead, and sea-run cutthroat trout.

Anadromous Watershed - Watersheds where anadromous fish habitat is present or easily could be reestablished.

At Risk Stocks - Stocks of Pacific anadromous fish that have been identified by professional societies, fish management agencies, and in the scientific literature as being in need of special management consideration because of low or declining populations.

Biological Diversity - The variety of life forms and processes, including the complete natural complex of species, communities, genes, and ecological functions.

Consultation - A formal interaction between the National Marine Fisheries Service or U.S. Fish and Wildlife Service and another Federal agency when it is determined that the agency's action may affect a species that has been listed as threatened or endangered or its critical habitat.

Critical Habitat - Under the Endangered Species Act, critical habitat is defined as (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the listed species, when it is determined that such areas are essential for the conservation of species.

Cumulative Effects - Those effects on the environment that result from the incremental effect of the action when added to the past, present, and reasonably foreseeable future actions regardless of what agency (Federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Drainage - An area (basin) mostly bounded by ridges or other similar topographic features, encompassing part, most, or all of a watershed.

Eastside - Generally, east of the crest of the Cascade Range in the States of Oregon and Washington.

Ecosystem Approach - A strategy or plan to manage ecosystems to provide for all associated organisms, as opposed to a strategy or plan for managing individual species.

Effects - Effects, impacts, and consequences, as used in this environmental assessment, are synonymous. Effects may be direct, indirect or cumulative.

Endangered Species - Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register.

Environmental Analysis - An analysis of alternative actions and their predictable short-term and long-term environmental effects, incorporating physical, biological, economic, and social considerations.

Environmental Assessment (EA) - A systematic analysis of site-specific or programmatic activities used to determine whether such activities have a significant effect on the quality of the physical, biological, and human environment and whether a formal environmental impact statement is required; and to aid an agency's compliance with the National Environmental Policy Act when no environmental impact statement is necessary.

Federal Land Policy and Management Act (FLPMA) - A law passed in 1976 applying to the BLM directing the management of lands administered by that agency including the requirement to develop land use plans and prepare regulations to guide that development.

Forest Plans - Land and Resource Management Plans developed by the Forest Service pursuant to requirements of the National Forest Management Act to guide land management.

High-priority, Ongoing Projects and Activities - Those ongoing projects and activities occurring on lands administered by the Agencies that are determined on a case-by-case examination to pose an unacceptable risk to aquatic and riparian habitat condition or "at risk" anadromous fish. Such factors as the condition of the watershed, the status of anadromous fish stocks in the watershed, and the magnitude, frequency, duration, and timing of the impacts caused by the ongoing activity shall be considered when determining if an unacceptable threat is being posed.

Interdisciplinary Team - A group of individuals with varying areas of specialty assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze the problem and propose action.

Interim Direction - Management direction that would guide management decisions on lands administered by the Agencies during the approximately 18 month period that Environmental Impact Statements are being prepared to examine longer-term options for management.

Intermittent Stream - Any non-permanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Key Watershed - A watershed that (1) is important to at risk anadromous fish, or (2) provides good anadromous fish habitat, or (3) is readily capable of providing good anadromous fish habitat; and is selected to contribute to a network across the landscape that provides for the long-term viability of anadromous fish.

LUPs - Land Use Plans developed by the Bureau of Land Management pursuant to the Federal land Policy and Management Act.

Mitigation Measures - Modifications of actions that (1) avoid impacts by not taking a certain action or parts of an action; (2) minimize impacts by limiting the degree or magnitude of the actions and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring - A process of collecting information to evaluate if objective and anticipated or assumed results of a management plan are being realized (effectiveness monitoring) or if implementation is proceeding as planned (implementation monitoring).

National Environmental Policy Act - An act passed in 1969 to declare a National policy that encourages productive and enjoyable harmony between humankind and the environment, promotes efforts that prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, enriches the understanding of the ecological systems and natural resources important to the nation, and establishes a Council on Environmental Quality.

National Forests - Lands administered by the USDA Forest Service.

National Forest Management Act (NFMA) - A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of Forest Plans and the preparation of regulations to guide that development.

On-going Projects and Activities - Projects and activities that have been approved, and implementation has begun and needed contracts or permits have been issued.

PACFISH - An inter-agency ecosystem management approach for maintaining and restoring healthy, functioning watersheds, riparian areas, and aquatic habitats within the range of Pacific anadromous fish on **Federal lands** managed by the USDI-Bureau of Land Management and the USDA-Forest Service.

Proposed Projects and Activities - Projects and activities that have not yet been approved, and those that have been approved, but implementation has not begun and contracts or permits have not been issued.

Public Lands - Lands administered by the USDI Bureau of Land Management.

Riparian Area - A geographic area containing an aquatic ecosystem and the adjacent upland areas that directly affect it. This includes floodplain, and associated woodland, rangeland, or other related upland areas.

Riparian Goals - The characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats that are established as a common expectation.

Riparian Management Objectives (RMOs) - Quantifiable measures of stream- and stream-side conditions that define good anadromous fish habitat, and serve as indicators against which attainment, or progress toward attainment, of the goals will be measured.

Riparian Habitat Conservation Areas (RHCA) - Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris and nutrient delivery systems.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows.

Salmon Summit - A regional effort convened by Senator Mark Hatfield that involved all interested parties in an effort during 1990-1991 to examine restoration of Columbia River Basin anadromous fish, and identify those actions that could eliminate the need to list Columbia River Basin anadromous fish under the Endangered Species Act.

Sensitive Species - Those plant or animal species for which population viability is a concern as evidence by a significant current or potential downwards trend in population numbers, distribution, density, or habitat capability.

Special Status Species - Those plant or animal species that are listed or are candidate or proposed for listing pursuant to the Federal Endangered Species Act; or those species that are listed pursuant to a state law or regulation, or those species that are designated as sensitive by the FS or the BLM.

Standards and Guidelines - The primary instructions for land managers. Standards address mandatory actions, while guidelines are recommended actions necessary to a land management decision.

Stock - A group of fish that spawn in a particular river system (or portion of it) during a particular season, and do not interbreed to any substantial degree with any other group of fish.

Threatened Species - Those plant or animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register.

Unacceptable Risk - A determination made through a case-by-case evaluation of the threat (or risk) posed by projects and activities to aquatic and riparian habitat, and anadromous fish. Such factors as the condition of the watershed, the status of anadromous fish stocks in the watershed, and the magnitude, frequency, duration, and timing of the impacts caused by the project or activity shall be considered when making the determination.

Viable Population - A viable population is one which has such numbers and distribution of reproductive individuals as to provide a high likelihood that a species will continue to exist and be well-distributed throughout its range.

Watershed - The drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

Watershed Analysis - A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis is a stratum of ecosystem management planning applied to watersheds of approximately 20 to 200 square miles.

Watershed Restoration - Actions taken to improve the current conditions of watershed to restore degraded habitat, and to provide long-term protection to natural resources, including riparian and aquatic resources.

Westside - Generally, west of the Cascade Range in the States of Oregon and Washington.

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APPENDIX B – AMOUNT OF ANADROMOUS WATERSHED ACREAGE

State/Administrative Unit	Size of Administrative Units in Millions of Acres	Anadromous Watersheds in Millions of Acres	Anadromous Watersheds as a Percent[1] of Total Administrative Unit
California			
Bakersfield	1.9	<0.1	<1%
Lassen NF	1.8	0.4	13%
Los Padres NF	1.2	0.2	20%
Ukiah BLM	0.7	0.1	15%
Idaho			
Boise NF	2.3	0.7	17%
Bitterroot NF	1.6	0.4	26%
Challis NF	2.5	1.6	83%
Clearwater NF	1.8	0.8	45%
Coeur d'Alene BLM	0.2	0.1	52%
Nez Perce NF	2.2	2.0	100%
Payette NF	2.3	1.7	77%
Salmon BLM	1.2	1.0	83%
Salmon NF	1.8	1.7	98%
Sawtooth NRA	0.8	0.3	80%
Oregon			
Malheur NF	1.5	0.7	50%
Ochoco NF	0.8	0.2	20%
Prineville BLM	1.6	1.2	12%
Umatilla NF	1.4	0.5	98%
Vale BLM	5.2	0.1	01%
Wallowa-Whitman NF	2.4	1.7	59%
Washington			
Spokane BLM	0.4	0.1	36%
Okanogan NF	1.7	0.3	20%
TOTAL	37.3[1]	15.8[1]	42%

[1]Any discrepancies are a result of rounding.

APPENDIX C - DESCRIPTION OF ALTERNATIVES CONSIDERED IN DETAIL

ALTERNATIVE 1

Alternative 1 is the "no action" alternative. Management of all ongoing and proposed projects and activities would continue pursuant to current direction contained in existing FS Land and Resource Management Plans (forest plans) and BLM Land Use Plans (LUPs) as modified by Endangered Species Act (ESA) section 7 consultations in those situations where there are species listed pursuant to the ESA. Under this alternative goals, objectives, standards and guidelines, and special areas (such as riparian management areas, wilderness areas, roadless areas, wild and scenic rivers, etc.) would be as defined in existing plans. No Watershed Analysis would be required. Grazing, minerals, and other activities would be managed with existing levels of administration.

ALTERNATIVE 2

Alternative 2 applies the aquatic and riparian components of the watershed and fish habitat emphasis option from the October 8, 1991 report to the Agriculture Committee and the Merchant Marine and Fisheries Committee of the U.S. House of Representatives by the Scientific Panel on Late-Successional Forest Ecosystems (Scientific Panel Report) to all proposed projects and activities. Ongoing projects and activities would continue to be managed in accordance with current management direction specified in existing forest plans and LUPs. The main points regarding aquatic and riparian management from the Scientific Panel Report are summarized as follows:

Within the geographic area being considered in this environmental assessment, the Scientific Panel Report specifies that Wilderness, Wild and Scenic Rivers, and the most ecologically significant late-successional, old growth forests be identified as "reserve areas." Reserve areas would be managed to maintain and/or enhance their ecological integrity. In general, removing merchantable timber from reserve areas is not appropriate. Such prohibitions are applied to timber sales under preparation but not yet awarded to buyers. Many other management activities may be appropriate in reserve areas during the interim, including fire suppression/prescription, precommercial silvicultural treatments of young stands, and restoration of aquatic habitats. Public use of these areas, such as for recreation, hunting, and fishing, may be allowed to continue as long as the activities are managed so that they do not impair attainment of the overall objectives. Scientific use of reserves is encouraged.

The Scientific Panel Report watershed and fish habitat emphasis option specifies the following Riparian Management Areas on lands administered by the Agencies:

(1) Wild, Scenic, and Recreational rivers designated or under study: no-harvest area 1/4 mile on each side of the stream or the width of the 100-year floodplain, whichever is larger, where water quality, fish, or other ecological values are described as part of the stream's outstandingly remarkable features.

(2) Major streams draining at least 30 square miles: no-harvest area 1/8 mile on each side of the stream or the width of the 100-year flood plain, whichever is larger.

(3) Fish-bearing streams: 300-foot no-harvest area on each side of the stream.

(4) Permanently flowing non-fish-bearing streams: 150-foot no-harvest area on each side of the stream.

(5) Seasonally flowing or intermittent streams: 50-foot no-harvest area on each side of the stream in areas of moderate and high soil instability.

No-harvest areas will vary with topographic and on-site conditions, but the horizontal width of such areas, implemented in practice, should reach the objectives expressed as averages here.

The Scientific Panel Report watershed and fish habitat emphasis option specifies the following additional standards and guidelines to augment those in current Forest Plans and Resource Management Plans:

for road systems and related road-drainage problems:

(1) Reduce and minimize road system mileage:

(a) Minimize construction of new roads, and construct no new roads in current roadless areas identified in the Forest Plans and Resource Management Plans.

(b) Remove (return to a natural condition) spur roads and other nonessential roads.

(2) Conduct a forest road-system analysis by National Forest and BLM District to identify road locations and practices that will reduce impacts to riparian areas of existing and new roads.

(3) Road drainage:

(a) Increase maintenance of road network during the rainy season.

(b) Upgrade culverts to larger sizes on existing and planned roads.

(c) Increase frequency of culverts on new and existing roads.

for logging slash treatment/prescribed fire:

(1) Eliminate hot burns on steep grounds.

(2) Eliminate burns in riparian management areas.

for livestock grazing:

(1) Include temporary and permanent exclusion from riparian areas to promote the reestablishment of shrubs, hardwoods, and fringe wetlands, and maintenance of stream-bank integrity.

for riparian and fish-habitat restoration:

(1) Establish a program that will ensure long-term stream-habitat stability.

for cumulative effects:

(1) Conduct an analysis by National Forest and BLM District to aid in the timing and location of timber harvest and location of roads and landings.

ALTERNATIVES 3 AND 4

Goals, Objectives, Standards, Guidelines, and Procedures (together referred to as "management direction") are the same for Alternatives 3 and 4. In Alternative 3, the management direction is applied only to proposed projects and activities. In Alternative 4, the management direction is applied to proposed projects and activities, as well as high priority, ongoing projects and activities.

The implementation of these alternatives could lead to deferring or suspending some resource management projects and activities within the Riparian Habitat Conservation Areas (RHCAs, described below) during the interim period. Implementation of these requirements during the interim period would not lead to the permanent removal of any project or activity from the RHCAs. The potential for permanent removal or elimination of any activity from the RHCAs is being examined in the EISs.

RIPARIAN GOALS (GOALS)

The goals establish an expectation of the characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats. Since the quality of water and fish habitat in aquatic systems is inseparably related to the integrity of upland and riparian areas within the watersheds, Alternatives 3 and 4 articulate several goals for watershed, riparian, and stream channel conditions. The goals are to maintain or restore:

(1) water quality to a degree that provides for stable and productive riparian and aquatic ecosystems;

(2) stream channel integrity, channel processes, and the sediment regime (including the elements of timing, volume, and character of sediment input and transport) under which the riparian and aquatic ecosystems developed;

(3) instream flows to support healthy riparian and aquatic habitats, the stability and effective function of stream channels, and the ability to route flood discharges;

(4) natural timing and variability of the water table elevation in meadows and wetlands;

(5) diversity and productivity of native and desired non-native plant communities in riparian zones;

(6) riparian vegetation to:

  (a) provide an amount and distribution of large woody debris characteristic of natural aquatic and riparian ecosystems;

  (b) provide adequate summer and winter thermal regulation within the riparian and aquatic zones;

  (c) help achieve rates of surface erosion, bank erosion, and channel migration characteristic of those under which the communities developed;

(7) riparian and aquatic habitats necessary to foster the unique genetic fish stocks that evolved within the specific geo-climatic region;

(8) habitat to support populations of well-distributed native and desired non-native plant, vertebrate, and invertebrate populations that contribute to the viability of riparian-dependent communities.

RIPARIAN MANAGEMENT OBJECTIVES (RMOs)

Landscape-scale interim RMOs describing good habitat for anadromous fish were developed using stream inventory data for pool frequency, large woody debris, bank stability and lower bank angle, and width to depth ratio. State water quality standards were used to define favorable water temperatures. All of the described features may not occur in a specific segment of stream within a watershed, but all generally should occur at the watershed scale for stream systems of moderate to large size (3rd to 7th order). Through watershed analysis, the specific objectives will be tailored to the geology, topography, climate, vegetation, and habitat needs of specific salmonid assemblages in the watersheds, and an assessment will be made of what habitat conditions are attainable in a given watershed.

The interim RMOs for stream channel, riparian, and watershed conditions provide the "criteria" against which attainment, or progress toward attainment, of the riparian goals are measured. Interim RMOs provide the target toward which Agency managers will be aiming as they conduct resource management activities across the landscape. Without the benchmark provided by measurable RMOs habitat suffers a continual erosion. The objectives should be time-specific to reflect the ecological capabilities of specific systems. As indicated parenthetically below, some of the objectives apply to forested ecosystems only, some to non-forested ecosystems, and some to all ecosystems regardless of whether or not they are forested. Six objectives have been identified, including one key feature (kf) and five supporting features (sf), that are good indicators of ecosystem health and are easily quantified and subject to accurate, repeatable measurements.

INTERIM RIPARIAN MANAGEMENT OBJECTIVES

Habitat Feature	Interim Objectives
Pool Frequency (kf) (all systems)	Varies by channel width, see below:
wetted width in feet:	10 20 25 50 75 100 125 150 200
number pools per mile:	96 56 47 26 23 18 14 12 9
Water Temperature (sf) (all systems)	Compliance with state water quality standards, or maximum <68F.
Large Woody Debris (sf) (forested systems)	Coastal California, Oregon, and Washington. >80 pieces per mile; >24 inch diameter; >50 foot length.
	East of Cascade Crest in Oregon, Washington, Idaho. >20 pieces per mile; >12 inch diameter; >35 foot length.
Bank Stability (sf) (non-forested systems)	>80 percent stable.
Lower Bank Angle (sf) (non-forested systems)	>75 percent of banks with <90 degree angle (i.e. undercut).
Width/Depth Ratio (sf) (all systems)	<10, mean wetted width divided by mean depth

APPLICATION OF INTERIM RMOs

Interim RMOs apply to all streams in watersheds with anadromous fish. Each of the interim objectives must be met or exceeded before general habitat conditions would be considered good for anadromous fish. However, application of the interim RMOs requires thorough analysis. That is, if the objective for the key feature of pool frequency is met or exceeded, there may be some latitude in assessing the importance of meeting the objectives for the supporting features that contribute to good habitat conditions. For example, in headwater steelhead streams with an abundance of pools, fewer pieces of large wood in the presence of an abundance of large boulders might still constitute good habitat. The goal is to achieve a high level of habitat diversity and complexity, through a combination of habitat features.

A watershed analysis can be used to determine habitat objectives that are desirable and attainable within specific streams or reaches of streams. Until such specific watershed analyses are completed, these interim RMOs will be used to estimate the differences between existing and good habitat conditions and trends relative to attainment of riparian goals.

RIPARIAN HABITAT CONSERVATION AREAS (RHCAs)

Interim RHCAs will be delineated in every anadromous watershed on lands administered by the Agencies.

RHCAs are portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecologic functioning is crucial to maintenance of the stream's water, sediment, woody debris and nutrient delivery systems.

The interim RHCA widths would apply until (1) Watershed Analysis is completed, (2) a site-specific analysis is conducted and described and the rationale for modification of interim RHCA boundaries is presented, or (3) the termination of the interim direction.

STANDARD WIDTHS DEFINING INTERIM RHCAs

Four categories of stream or water body, and the standard widths for each are:

Category 1 - **Fish-bearing streams**: Interim RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Category 2 - **Permanently flowing non-fish-bearing streams**: Interim RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year flood plain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is greatest.

Category 3 - **Ponds, lakes, reservoirs, and wetlands greater than 1 acre**: Interim RHCAs consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or to the extent of moderately and highly unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, whichever is greatest.

Category 4 - **Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas**: This category includes features with high variability in size and site-specific characteristics. At a minimum the interim RHCAs must include:

a. the extent of landslides and landslide-prone areas,

b. the intermittent stream channel and the area to the top of the inner gorge,

c. the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation, and

d. for Key Watersheds, the area from the edges of the stream channel, wetland, landslide, or landslide-prone area to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest;

e. for watersheds not identified as Key Watersheds, the area from the edges of the stream channel, wetland, landslide, or landslide-prone area to a distance equal to the height of one-half site potential tree, or 50 feet slope distance, whichever is greatest.

In non-forested rangeland ecosystems, the interim RHCA width for permanently flowing streams in category 1 and 2 is the extent of the 100 year flood plain.

STANDARDS AND GUIDELINES

Project and site-specific standards and guidelines listed below will apply to all Riparian Habitat Conservation Areas. The combination of the standards and guidelines for RHCAs specified below with the standards and guidelines of existing forest plans and LUPs will provide a benchmark for management activities that reflects increased sensitivities and a commitment to ecosystem management.

The standards and guidelines listed below are those developed as part of the PACFISH strategy. Under alternative 3, the standards and guidelines would be applied to proposed projects and activities. Ongoing projects and activities would continue during the interim period in accordance with management direction in current forest plans and LUPs.

Under alternative 4 the standards and guidelines listed below would apply to proposed projects and activities as well as high priority, ongoing projects and activities. However, due to the short-term duration of this interim direction, provisions requiring the relocation or elimination of existing roads, facilities, and other improvements will not be required during the interim period (18 months). Instead of relocation or elimination, improvements found to be causing an unacceptable risk will be closed. The option of relocation or elimination of existing projects and activities will, however, be explored as part of the longer-term strategy being developed in the geographically specific EISs.

Timber Management

TM-1. Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below. Riparian Habitat Conservation Areas shall not be included in the land base used to determine the Allowable Sale Quantity, but any volume harvested can contribute to the timber sale program.

a. Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting if there are no impacts that are inconsistent with attainment of Riparian Management Objectives.

b. Remove salvage trees only when present and future woody debris needs are met and other Riparian Management Objectives are not adversely affected.

c. Apply silvicultural practices for Riparian Habitat Conservation Areas to control stocking, reestablish and culture stands, and acquire desired vegetation characteristics in a manner that assures Riparian Management Objectives are met.

Roads Management

RF-1. Cooperate with federal, Tribal, state, and county agencies, and cost-share partners to achieve consistency in road design, operation, and maintenance necessary to attain Riparian Management Objectives.

RF-2. For each existing or planned road, meet the Riparian Management Objectives by:

a. minimizing road and landing locations in Riparian Habitat Conservation Areas.

b. completing Watershed Analyses prior to construction of new roads or landings in Riparian Habitat Conservation Areas.

c. establishing and developing Road Management Objectives for each road, including preparation of:

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

2. operation and maintenance criteria that govern road operation, maintenance, and management.

d. minimizing sediment delivery to streams from the road surface.

1. outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe.

2. route road drainage away from potentially unstable channels, fills, and hillslopes.

e. minimizing disruption of natural hydrologic flow paths.

f. restricting sidecasting.

RF-3. Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives by:

a. reconstructing road and drainage features that pose a substantial risk.

b. prioritizing reconstruction based on the 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 not needed for future management activities.

RF-4. New culverts, bridges and other stream crossings in locations of substantial risk, and existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions will be improved to accommodate a 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. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

RF-6. Develop and implement a Road Management Plan or a Transportation Management Plan that will meet the Riparian Management Objectives. This plan shall address items such as the following:

a. Road Management Objectives for each road.

b. road operation and maintenance.

c. post-storm inspections and maintenance.

d. during-storm inspections and maintenance.

e. regulation of traffic during wet periods.

Grazing Management

GM-1. Adjust grazing practices (e.g. length of grazing season, stocking levels, timing of grazing, etc.) to eliminate impacts that are inconsistent with attainment of Riparian Management Objectives. If adjusting practices is not effective, eliminate grazing.

GM-2. Locate new livestock handling and/or management facilities outside Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat Conservation Areas, assure that Riparian Management Objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.

GM-3. Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will assure Riparian Management Objectives are met.

GM-4. Adjust wild horse and burro management to eliminate impacts that are inconsistent with attainment of Riparian Management Objectives.

Recreation Management

RM-1. Design, construct, and operate recreation facilities, including trails and dispersed sites, within Riparian Habitat Conservation Areas in a manner that contributes to attainment of the Riparian Management Objectives. For existing recreation facilities inside Riparian Habitat Conservation Areas, assure that Riparian Management Objectives are met. Where Riparian Management Objectives cannot be met, require relocation or closure of recreation facilities.

RM-2. Adjust dispersed and developed recreation practices that are inconsistent with attainment of Riparian Management 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, Wilderness, and other Recreation Management plans will address attainment of Riparian Management Objectives.

Minerals Management

MM-1. If the Notice of Intent indicates a mineral operation could affect attainment of Riparian Management Objectives, require a reclamation plan, approved Plan of Operations (or other such governing document), and reclamation bond. Impacts that cannot be avoided will be reclaimed after operations to as near the pre-mining condition as practicable to meet Riparian Management Objective. Reclamation Plans will contain measurable attainment and bond release criteria for each reclamation activity.

MM-2. Locate structures, support facilities, and roads outside Riparian Habitat Conservation Areas. Where no alternative to siting facilities in Riparian Habitat Conservation Areas exists, locate in a way compatible with Riparian Management Objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. 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 Habitat Conservation Areas. If no practicable alternative to locating mine waste (waste rock, spent ore, tailings) facilities in Riparian Habitat Conservation Areas 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 Habitat Conservation Areas.

c. monitor waste and waste facilities to confirm predictions of chemical and physical stability, and make adjustments to operations as needed.

d. reclaim waste facilities after operations to assure chemical and physical stability and to meet the Riparian Management 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 Habitat Conservation Areas for oil, gas, and geothermal exploration and development activities where contracts and leases do not already exist, unless there are no other options for location and Riparian Management Objectives can be met. Adjust the operating plans of existing contracts to eliminate impacts that are inconsistent with attainment of Riparian Management Objectives.

MM-5. Sand and gravel mining and extraction within Riparian Habitat Conservation Areas will occur only if Riparian Management Objectives can be met.

MM-6. Develop inspection and monitoring requirements for mineral activities. Evaluate the results of inspection and monitoring to modify mineral plans, leases or permits as needed to eliminate impacts that are inconsistent with attainment of Riparian Management Objectives.

Fire/Fuels Management

FM-1. Design fuel treatment and fire suppression strategies, practices, and activities to meet Riparian Management 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 fuel management activities could perpetuate or be damaging to long-term ecosystem function.

FM-2. Locate incident bases, camps, helibases, staging areas, helispots and other centers for incident activities outside of Riparian Habitat Conservation Areas. If the only suitable location for such activities is within the Riparian Habitat Conservation Area, an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Utilize an interdisciplinary team to predetermine suitable incident base and helibase locations during presuppression planning.

FM-3. Minimize delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where over-riding immediate safety imperatives exist, or, following a 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 the attainment of the Riparian Management Objectives.

FM-5. Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Riparian Management Objectives whenever Riparian Habitat Conservation Areas are significantly damaged by a wildfire or a prescribed fire burning out of prescription.

Lands

LH-1. For hydroelectric and other surface water development proposals, require instream 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 Federal Energy Regulatory Commission (FERC) that require flows and habitat conditions that maintain/restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate state agencies.

LH-2. Locate new hydroelectric ancillary facilities outside Riparian Habitat Conservation Areas. For existing ancillary facilities inside the RHCA that are essential to proper management, provide recommendations to FERC that assure the Riparian Management Objectives are met. Where these objectives cannot be met, provide recommendations to FERC that such ancillary facilities should be relocated. Hydroelectric facilities that must be located in the Riparian Habitat Conservation Area, will be located, operated, and maintained to eliminate adverse effects that are inconsistent with attainment of the Riparian Management Objectives.

LH-3. Issue leases, permits, rights-of-way, and easements to avoid adverse effects that are inconsistent with attainment of the Riparian Management Objectives. Where the authority to do so was retained, adjust existing leases, permits, rights-of-way, and easements to eliminate adverse effects that are inconsistent with attainment of the Riparian Management Objectives. If adjustments are not effective, eliminate the activity. Where the authority to adjust was not retained, negotiate to make changes in existing leases, permits, rights-of-way, and easements to eliminate adverse effects that are inconsistent with attainment of the Riparian Management Objectives. Priority for modifying existing leases, permits, rights-of-way, and easements will be based on the current and potential impact and the ecological value of the riparian resources affected.

LH-4. Use land acquisition, exchange, and conservation easements to meet Riparian Management Objectives and facilitate restoration of fish stocks and other species at risk of extinction.

General Riparian Area Management

RA-1. Identify and cooperate with federal, Tribal, state and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

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

RA-3. Apply herbicides, pesticides, and other toxicants, and other chemicals in a manner to avoid impacts that are inconsistent with attainment of Riparian Management Objectives.

RA-4. Locate water drafting sites to minimize adverse effects on stream channel stability, sedimentation, and in-stream flows.

Watershed and Habitat Restoration

WR-1. Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserve the genetic integrity of native species, and contributes to attainment of Riparian Management Objectives.

WR-2. Cooperate with Federal, State, local, and Tribal agencies, and private land-owners to develop watershed-based Coordinated Resource Management Plans (CRMPs) or other cooperative agreements to meet Riparian Management Objectives.

Fisheries and Wildlife Restoration

FW-1. Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of the Riparian Management Objectives.

FW-2. Design, construct and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that is consistent with attainment of the Riparian Management Objectives. For existing fish and wildlife interpretive and other user-enhancement facilities inside Riparian Habitat Conservation Areas, assure that Riparian Management Objectives are met. Where Riparian Management 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 the Riparian Management Objectives.

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

KEY WATERSHEDS

Key Watersheds already have been designated in California, Oregon, and Washington within the range of the northern spotted owl (Northern Spotted Owl DSEIS). The same criteria will be used to designate key watersheds in the 15 national forests and 7 BLM Districts:

(1) watersheds with stocks listed pursuant to the Endangered Species Act, or stocks identified in the 1991 American Fisheries Society report as "at risk;" or,

(2) watersheds that contain excellent habitat for mixed salmonid assemblages; or,

(3) degraded watersheds with a high restoration potential.

Key Watersheds will be identified from among those that meet the three criteria specified above so as to provide a pattern of protection across the landscape where habitat for anadromous fish would receive special attention and treatment. These watersheds would protect or restore habitat for listed stocks, stocks of special interest or concern, or salmonid assemblages of critical value for productivity or biodiversity. Areas in good condition would serve as anchors for the potential recovery of depressed stocks, and also would provide colonists for adjacent areas where habitat had been degraded by land management or natural events. Those areas of lower quality habitat with a high potential for restoration would become future sources of good habitat with the implementation of a comprehensive restoration program.

WATERSHED ANALYSIS

Watershed Analysis is a systematic procedure for determining how a watershed functions in relation to its physical and biological components. This is accomplished through consideration of history, processes, landform, and condition. Because management direction applies only to proposed projects and activities under alternative 3, it is not anticipated that extensive Watershed Analysis would be initiated under this alternative. Generally, under alternative 3 Watershed Analysis would be initiated where the interim RMOs and the interim RHCA widths do not adequately reflect specific watershed capabilities. Under alternative 4 there is a need to conduct a case-by-case evaluation of ongoing projects and activities. As a consequence, it is expected that Watershed Analysis would be initiated in more watersheds under alternative 4 than would be expected under alternative 3. The Watershed Analysis protocol is designed to provide consistency in application and in scientific rigor, and is the same for alternatives 3 and 4.

Watershed Analysis is a prerequisite for determining which processes and parts of the landscape affect fish and riparian habitat, and is essential for defining watershed-specific boundaries for Riparian Habitat Conservation Areas and for Riparian Management Objectives. Watershed Analysis forms the basis for evaluating cumulative watershed effects; defining watershed restoration needs, goals and objectives; implementing restoration strategies; and monitoring the effectiveness of watershed protection measures. Watershed Analysis employs the perspectives and tools of multiple disciplines, especially geomorphology, hydrology, geology, aquatic and terrestrial ecology, and soil science. It is the framework for understanding and implementing land use activities within a geomorphic context, and is a major component of the evolving science of ecosystem analysis. Watershed Analysis is an iterative process which includes monitoring, evaluation, and adjustment to incorporate detected changes.

Watershed Analysis consists of a sequence of activities designed to identify and interpret the processes operating in a specific landscape. The components and intensity of the analysis will vary depending on level of activity and significance of issues involved. The overall goals of Watershed Analysis are to:

1. Screen current watershed condition:

   a. Characterize the geomorphic, ecologic, and hydrologic context of a watershed, and identify the uses in the watershed.

   b. Determine the type, extent, frequency, and intensity of watershed processes, including mass soil movements, fire, peak and low streamflows, surface erosion, and other processes affecting the flow of water. sediment, organic material, and nutrients through a watershed.

c. Determine the distribution, abundance, life histories, habitat requirements, and limiting factors for fish and other aquatic and riparian dependent species.

d. Identify parts of the landscape, including hill slopes and channels, that are either sensitive to specific disturbance processes or are critical to beneficial uses, key anadromous fish stocks or other species.

2. Interpret watershed history, including the effects of previous natural disturbances and land use activities on watershed processes.

3. Establish ecologically and geomorphically appropriate boundaries of Riparian Habitat Conservation Areas.

4. Establish ecologically and geomorphically appropriate Riparian Management Objectives.

5. Identify necessary adjustments to resource output projections (e.g. board-feet, animal unit months, and recreation visitor days projected in forest plans, LUPs and other planning documents).

6. Identify watershed restoration objectives, strategies, and priorities.

7. Design approaches to evaluate and monitor the effectiveness of standards and guidelines for mitigating impacts of current uses and contributing to the attainment of Riparian Management Objectives, and the effectiveness of restoration efforts in correcting past degradation.

8. Monitor and modify projects and activities to improve or maintain watershed condition.

9. Design approaches to evaluate and monitor the reliability of the analysis procedure.

To provide accountability, Watershed Analysis includes a certification process through which the responsible line officer certifies that the analysis has been conducted and completed according to the expected scientific standards. The line officer responsible for certification is determined by the relationship of the watershed analyzed to the Agency's administrative boundaries. For example, if the watershed analyzed lies entirely within one national forest or BLM district, then the FS Forest Supervisor and

BLM District Manager would certify the sufficiency of the analysis upon its completion. If, however, the watershed crosses FS Regional boundaries or BLM State Office boundaries, the certifying line officers would be the FS Chief and the BLM Director. Interested individuals, organizations, Tribal governments, and state and other federal agencies will be provided an opportunity to participate in the certification process.

WATERSHED RESTORATION

Watershed restoration comprises actions taken to improve the current conditions of watersheds to restore degraded habitat, and to provide long-term protection to natural resources, including riparian and aquatic resources. Alternative 3 and 4 assume that no additional funds will be available for watershed restoration during the interim period, but that these existing funds will be retargeted, as necessary, to establish a watershed restoration management program that includes:

1) A regional strategy that looks across landscapes and ownerships within the watershed to identify where restoration efforts are likely to be most effective.

2) Use of Watershed Analysis to adapt restoration strategies to specific landscapes, taking into account unique watershed histories, conditions, and resources.

3) A specific set of objectives for each watershed.

4) Restoration/mitigation practices based on the results of Watershed Analysis, and are designed to ameliorate the impacts of human activities within the watershed.

5) Monitoring and evaluation to define and refine restoration objectives and track the effectiveness of restoration efforts.

Priority in conducting watershed restoration will be given to Key Watersheds.

ALTERNATIVE 5

Alternative 5 applies the same riparian goals, interim Riparian Management Objectives, Riparian Habitat Conservation Areas, and standards and guidelines; uses the same protocol for Key Watershed identification and Watershed Analysis; and applies the same criteria for watershed restoration as Alternatives 3 and 4, with the following exceptions. In alternative 5:

1. interim RHCA widths are the same as in Alternatives 3 and 4, except that for category four (seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas) Alternative 5 does not distinguish between Key and non-Key Watersheds. For category four areas in all watersheds, Alternative 5 specifies that the interim RHCAs must include:

   a. the extent of landslides and landslide-prone areas,

   b. the intermittent stream channel and the area to the top of the inner gorge,

   c. the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation, and

   d. the area from the edges of the stream channel, wetland, landslide, or landslide-prone area to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.

2. Watershed Analysis, although conducted as described for alternatives 3 and 4, must be completed in Key Watersheds prior to initiation of any new projects and activities therein.

3. the management direction is applied to all proposed and all ongoing projects and activities.

APPENDIX D - LIST OF BUREAU OF LAND MANAGEMENT LAND USE PLANS AND FOREST SERVICE LAND AND RESOURCE MANAGEMENT PLANS

Bureau of Land Management

CALIFORNIA

BAKERSFIELD DISTRICT

USDI Bureau of Land Management, California State Office. 1984. *Hollister Management Framework Plan*. August 1984. Bakersfield District, Hollister Resource Area. Bakersfield, California.

UKIAH DISTRICT

USDI Bureau of Land Management, California State Office. 1993. *Redding Resource Management Plan and Environmental Impact Statement*. June 1993. Ukiah District, Redding Resource Area. Ukiah, California.

IDAHO

SALMON DISTRICT

USDI Bureau of Land Management, Idaho State Office. 1979. *Challis Management Framework Plan*. July 1979. Challis Resource Area, Salmon District. Salmon, Idaho.

USDI Bureau of Land Management, Idaho State Office. 1982. *Ellis-Pahsimeroi Management Framework Plan*. September 1982. Challis Resource Area, Salmon District. Salmon, Idaho.

USDI Bureau of Land Management, Idaho State Office. 1984. *Mackay Management Framework Plan*. January 1984. Challis Resource Area, Salmon District. Salmon, Idaho.

USDI Bureau of Land Management, Idaho State Office. 1987. *Lemhi Resource Management Plan and Environmental Impact Statement.* April 1987. Salmon District, Lemhi Resource Area. Salmon, Idaho.

COEUR D'ALENE DISTRICT

USDI Bureau of Land Management, Idaho State Office. 1981. *Chief Joseph Management Framework Plan.* November 1981. Coeur d'Alene District, Cottonwood Resource Area, Coeur d'Alene, Idaho.

OREGON/WASHINGTON

PRINEVILLE DISTRICT

USDI Bureau of Land Management, Oregon State Office. 1985. *John Day Resource Management Plan and Environmental Impact Statement.* August 1985. Prineville District. Prineville, Oregon.

USDI Bureau of Land Management, Oregon State Office. 1986. *Two Rivers Resource Management Plan and Environmental Impact Statement.* June 1986. Prineville District. Prineville, Oregon.

USDI Bureau of Land Management, Oregon State Office. 1989. *Brothers Lapine Resource Management Plan and Environmental Impact Statement.* July 1989. Prineville District. Prineville, Oregon.

SPOKANE DISTRICT

USDI Bureau of Land Management, Oregon State Office. 1987. *Spokane Resource Management Plan and Environmental Impact Statement.* May 1987. Spokane District. Spokane, Washington.

VALE DISTRICT

USDI Bureau of Land Management, Oregon State Office. 1989. *Baker Resource Management Plan and Environmental Impact Statement.* July 1989. Vale District, Baker Resource Area. Vale, Oregon.

Forest Service

CALIFORNIA

LASSEN NATIONAL FOREST

USDA Forest Service, Pacific Southwest Region. 1992. *Final Environmental Impact Statement for the Land and Resource Management Plan - Lassen National Forest.* 1992. Lassen National Forest. Susanville, California.

USDA Forest Service, Pacific Southwest Region. 1992. *Land and Resource Management Plan - Lassen National Forest.* 1992. Lassen National Forest. Susanville, California.

LOS PADRES NATIONAL FOREST

USDA Forest Service, Pacific Southwest Region. 1988. *Final Environmental Impact Statement, Land and Resource Management Plan - Los Padres National Forest.* March 1988. Los Padres National Forest. Goleta, California.

USDA Forest Service, Pacific Southwest Region. 1988. *Land and Resource Management Plan - Los Padres National Forest.* March 1988. Los Padres National Forest. Goleta, California.

IDAHO

BITTERROOT NATIONAL FOREST

USDA Forest Service, Northern Region. 1987. *Final Environmental Impact Statement for the Bitterroot National Forest Land and Resource Management Plan.* September 1987. Bitterroot National Forest. Hamilton, Montana.

USDA Forest Service, Northern Region. 1987. *Bitterroot National Forest Land and Resource Management Plan.* September 1987. Bitterroot National Forest. Hamilton, Montana.

BOISE NATIONAL FOREST

USDA Forest Service, Intermountain Region. 1990. *Final Environmental Impact Statement for the Boise National Forest Land and Resource Management Plan.* April 1990. Boise National Forest. Boise, Idaho.

USDA Forest Service, Intermountain Region. 1990. *Boise National Forest Land and Resource Management Plan.* April 1990. Boise National Forest. Boise, Idaho.

CHALLIS NATIONAL FOREST

USDA Forest Service, Intermountain Region. 1987. *Final Environmental Impact Statement for the Challis National Forest Land and Resource Management Plan.* June 1987. Challis National Forest. Challis, Idaho.

USDA Forest Service, Intermountain Region. 1987. *Challis National Forest Land and Resource Management Plan.* June 1987. Challis National Forest. Challis, Idaho.

CLEARWATER NATIONAL FOREST

USDA Forest Service, Northern Region. 1987. *Final Environmental Impact Statement for the Clearwater National Forest Land and Resource Management Plan.* September 1987. Clearwater National Forest. Orofino, Idaho.

USDA Forest Service, Northern Region. 1987. *Clearwater National Forest Land and Resource Management Plan.* Spetember 1987. Clearwater National Forest. Orofino, Idaho.

NEZ PERCE NATIONAL FOREST

USDA Forest Service, Northern Region. 1987. *Final Environmental Impact Statement for the Nez Perce National Forest Plan.* October 1987. Nez Perce National Forest. Grangeville, Idaho.

USDA Forest Service, Northern Region. 1987. *Nez Perce National Forest Plan.* October 1987. Nez Perce National Forest. Grangeville, Idaho.

PAYETTE NATIONAL FOREST

USDA Forest Service, Intermountain Region. 1988. *Final Environmental Impact Statement for the Land and Resource Management Plan for the Payette National Forest.* May 1988. Payette National Forest. McCall, Idaho.

USDA Forest Service, Intermountain Region. 1988. *Land and Resource Management Plan for the Payette National Forest.* May 1988. Payette National Forest. McCall, Idaho.

SALMON NATIONAL FOREST

USDA Forest Service, Intermountain Region. 1988. *Final Environmental Impact Statement for the Salmon National Forest Land and Resource Management Plan.* January 1988. Salmon National Forest. Salmon, Idaho.

USDA Forest Service, Intermountain Region. 1988. *Salmon National Forest Land and Resource Management Plan.* January 1988. Salmon National Forest. Salmon, Idaho.

SAWTOOTH NATIONAL FOREST

USDA Forest Service, Intermountain Region. 1987. *Final Environmental Impact Statement for the Sawtooth National Forest Land and Resource Management Plan.* September 1988. Sawtooth National Forest. Twin Falls, Idaho.

USDA Forest Service, Intermountain Region. 1987. *Sawtooth National Forest Land and Resource Management Plan.* September 1988. Sawtooth National Forest. Twin Falls, Idaho.

OREGON/WASHINGTON

MALHEUR NATIONAL FOREST

USDA Forest Service, Pacific Northwest Region. 1990. *Final Environmental Impact Statement - Malheur National Forest - Land and Resource Management Plan.* May 1990. Malheur National Forest. John Day, Oregon.

USDA Forest Service, Pacific Northwest Region. 1990. *Malheur National Forest - Land and Resource Management Plan.* May 1990. Malheur National Forest. John Day, Oregon.

OCHOCO NATIONAL FOREST

USDA Forest Service, Pacific Northwest Region. 1989. *Final Environmental Impact Statement - Land and Resource Management Plans - Ochoco National Forest and Crooked River National Grassland.* August 1989. Ochoco National Forest. Prineville, Oregon.

USDA Forest Service, Pacific Northwest Region. 1989. *Land and Resource Management Plans - Ochoco National Forest and Crooked River National Grassland.* August 1989. Ochoco National Forest. Prineville, Oregon.

OKANOGAN NATIONAL FOREST

USDA Forest Service, Pacific Northwest Region. 1989. *Final Environmental Impact Statement - Land and Resource Management Plan - Okanogan National Forest.* 1989. Okanogan National Forest. Okanogan, Washington.

USDA Forest Service, Pacific Northwest Region. 1989. *Land and Resource Management Plan - Okanogan National Forest.* 1989. Okanogan National Forest. Okanogan, Washington.

UMATILLA NATIONAL FOREST

USDA Forest Service, Pacific Northwest Region. 1990. *Final Environmental Impact Statement - Forest Land and Resource Management Plan - Umatilla National Forest.* 1990. Umatilla National Forest. Pendleton, Oregon.

USDA Forest Service, Pacific Northwest Region. 1990. *Forest Land and Resource Management Plan - Umatilla National Forest.* 1990. Umatilla National Forest Pendleton, Oregon.

WALLOWA-WHITMAN NATIONAL FOREST

USDA Forest Service, Pacific Northwest Region. 1990. *Final Environmental Impact Statement - Wallowa-Whitman National Forest Land and Resource Management Plan.* April 1990. Wallowa-Whitman National Forest. Baker, Oregon.

USDA Forest Service, Pacific Northwest Region. 1990. *Wallowa-Whitman National Forest Land and Resource Management Plan.* April 1990. Wallowa-Whitman National Forest. Baker, Oregon.

APPENDIX E – LIST OF BRIEFINGS AND CORRESPONDENCE

Table E-1. External Briefings.

Name of Organization Briefed	Date of Briefing
House and Senate	
Senate Agriculture Committee	May 24, 1993
House Agriculture Committee – Subcommittee on Speciality Crops and Natural Resources	October 21, 1993
House Merchant Marine and Fisheries Committee – Fisheries Subcommittee	October 7, 1993
Personal staffs of Alaska Congressional delegation	August 5, 1993
House and Senate Congressional staff	April 1992; January 1993
Federal Agencies	
Council on Environmental Quality	January & March 1994
Environmental Protection Agency	August 1993
USDA Soil Conservation Service	August 4 & 10, 1993
USDC National Marine Fisheries Service	July 1992; October 15, 1993
USDI Bureau of Indian Affairs	August 4, 1993
USDI Fish and Wildlife Service	July 1992; July 28, 1993; February 10, 1994
US Department of Justice	October 1992; Summer 1993; February 1994
State Agencies	
Alaska Governor's Office (et al.)	September 8-9, 1993
Alaska Dept. of Commerce and Economic Development	September 8-9, 1993
Alaska Department of Fish and Game	September 8-9, 1993
Columbia Basin Fish & Wildlife Authority	April, October 1993
International Association of Fish & Wildlife Agencies	April 1992; September 14, 1993
Non-point Source Water Quality Monitoring Workshop	January 4, 1993
Oregon Department of Fish & Wildlife	September 1993
University of Washington	January 11, 1993
Virginia State University and Polytechnic Institute	February 1, 1994
Western Legislative Forestry Task Force	September 18, 1993
Tribal Governments	
Tribal Governments of the Northwest	July, November, December 1992
Columbia River Intertribal Fish Commission	July 25-30, 1993
Nez Perce	July 25-30, 1993
Northwest Indian Fisheries Commission	July 25-30, 1993
Shoshone-Bannock	July 25-30, 1993
Umatilla	July 25-30, 1993
Warm Springs	July 25-30, 1993
Yakama	July 25-30, 1993

Table E-1. External Briefings (Cont.)

Name of Organization Briefed	Date of Briefing
Organizations	
Alaska Trollers Association	September 1993
American Fisheries Society	April 1992; April 14, November 15, September 16, 1993
Bonneville Power Administration	June 1993
Klamath Restoration Alliance	May 20, 1993
National Cattlemen's Association	September 21, 1993
Natural Resources Defense Council	September 16, 1993
Northwest Forestry Association	August 1993
Northwest Hydroelectric Association	February 2, 1993
Northwest Power Planning Council	June 1992; June 1993
Oregon Cattlemen's Association	September 1992
Pacific Coast Federal of Fishermen's Associations	September 1993
Pacific Rivers Council	April 1992; April 14, December 2, 1993
Public Lands Council	September 1992; June 9, 1993
Society for Range Management	June 9, 1993
Society of American Foresters	June 9, 1993
Southeast Alaska Conservation Council	September 19, 1993
Sport Fishing Institute	April 1992; April 14, 1993
Trout Unlimited	April, August 1992; April 14, March 26, August 6, October 10, 1993
United Fisherman of Alaska	September 3, 1993
Weyerhauser	September 19, 1993
The Wilderness Society	April 1992
The Wildlife Society	June 9, 1993

Table E-2. Letters Received.

Name of Correspondent	Date of Letter
Senate	
Senator Jim Duncan	September 30, 1993
Senator Ted Stevens (News Release)	September 15, 1993
Senator Ted Stevens (News Release)	October 6, 1993
Federal Agencies	
Environmental Protection Agency	August 26, 1993
Environmental Monitoring and Assessment Program	December 14, 1993
Office of the Chief Scientist	January 27, 1994
USDI National Marine Fisheries Service	November 8, 1993
USDI Fish and Wildlife Service	August 26, 1993
State Governments	
Alaska Department of Commerce and Economic Development	September 27, 1993
Alaska Office of the Governor	August 1993
Board of Commissioners – County of Coos, Oregon	October 14, 1993
California Department of Forestry	December 12, 1993
Columbia Basin Fish & Wildlife Authority	January 27, 1994
Oregon Water Resources Department	November 1993
Western Legislative Forestry Task Force	October 6, 1993
Tribal Governments	
Confederated Tribes and Bands of the Yakima Indian Nation	July 29, 1993
Nez Perce Tribal Executive Committee	July 27, 1993
Organizations	
The AFSEEE Activities (News Article)	August 1993
Alaska Center for the Environment	September 3, 1993
Alaska Center for the Environment, et. al. (News Release)	September 28, 1993
Alaska Trollers Association	September 18, 1993
Alaska Council of Trout Unlimited	October 10, 1993
American Fisheries Society – Alaska Chapter	September 23, 1993
American Fisheries Society – Humboldt Chapter	April 24, 1993
American Fisheries Society – Idaho Chapter	September 13, 1993
American Fisheries Society - Virginia Tech Chapter	September 1, 1993
American Fisheries Society, et. al.[1]	September 21, 1993
American Rivers	August 5, 1993
American Rivers (News Release)	September 28, 1993
B.A.S.S. Inc.	September 27, 1993
Black Hills Audubon Society	September 8, 1993
Canadian Wildlife Federation	March 26, 1993
Coalition for the Conservation of Aquatic Habitat	November 5, 1993
Environmental Defense Fund	January 27, 1994
Health to the Salmon	January 27, 1994

[1]Letter to the Interior Appropriations Conference.

Table E-2. Letters Received (Cont.)

Name of Correspondent	Date of Letter
Organizations (Cont.)	
National Audubon Society	September 24, 1993
National Forestry Associaton	August 9, 1993
Northwest Forestry Association	August 9, 1993
Oregon Trout	January 27, 1994
Preston, Thorgrimson, Shidler, Gates & Ellis	October 25, 1993
United Fishermen of Alaska	September 3, 1993
Weyerhaeuser	September 23, 1993
Individuals	
Thomas Angenent	August 20, 1993
Pat & Bill Bleha	September 7, 1993
Charles Chesney	November 1993
Stew Churchwell	August 27, 1993
Margaret Conradsen	September 3, 1993
William and Ramona Crooks	August 30, 1993
James H. Delano	August 29, 1993
Marv D. Dovni	Updated
Bob Finhaus	Undated
Doug Goodall	Undated
Marnie Graham	September 10, 1993
Gary Gunsstrom	November 2, 1993
Dennis Honkomp	Undated
H. James Howe	August 22, 1993
John Hurbuni	Updated
Robert R. Jammes	August 26, 1993
Alberta Kittleson	August 27, 1993
Rebecca J. Knight	September 10, 1993
James Lichatowich (Mobrand Biometrics)	January 27, 1994
Tad Mastersen	September 16, 1993
Gertrude C. Minnix	August 27, 1993
Richard T. Myren	September 8, 1993
John and Karyn Nelson	August 28, 1993
Kyle Nelson	September 9, 1993
Nancy R. Norsen	August 28, 1993
Dr. Robert L. Olson	August 25, 1993
David Patenavde	September 2, 1993

Table E-2. Letters Received (Cont.)

Name of Correspondent	Date of Letter
Individuals (Cont.)	
Dr. Nathanel A. Peters & Juanita I. Peters	September 8, 1993
David W. Roberts	January 27, 1994
Peggy Robinson	September 25, 1993
Ron and Martha Robinson	August 23, 1993
Dr. John A. Satterwhite	September 1, 1993
Bill Scarbourg	August 28, 1993
Dr. Dan Silver	August 25, 1993
Carol Soth	August 30, 1993
Kersten Tanner	Undated
Sal Tromba	Undated
Robert Tuck	January 27, 1994
Kathleen VanWihl	August 27, 1993
Jay S. Wakefield	August 20, 1993
Bud Wakeland	September 2, 1993
Howard J. Whitaker	August 31, 1993
Ray White	January 27, 1994
Ron Yockim	February 23, 1993

BIOLOGICAL EVALUATION
FOR THE

ENVIRONMENTAL ASSESSMENT FOR THE
INTERIM STRATEGIES FOR MANAGING ANADROMOUS
FISH-PRODUCING WATERSHEDS ON FEDERAL LANDS
IN EASTERN OREGON AND WASHINGTON, IDAHO,
AND PORTIONS OF CALIFORNIA

U.S.D.A. Forest Service and U.S.D.I. Bureau of Land Management

A. INTRODUCTION

This Biological Evaluation (BE) analyzes the potential effects, from a programmatic standpoint, of the alternatives considered and developed in the Environmental Assessment (EA) on species listed under the Endangered Species Act (ESA) and those species identified as sensitive by the U.S.D.A. Forest Service (FS) and U.S.D.I. Bureau of Land Management (BLM), (collectively referred to as Agencies.). The purpose of this evaluation is to determine if implementation of the alternatives considered and developed in the EA would result in a "may effect" or "no effect" to the species and/or critical habitat listed or proposed under the ESA; the evaluation will also determine if implementation of the alternatives considered and developed in the EA would result in a loss of viability of the sensitive species or move sensitive species toward federal listing under the ESA.

B. AREA COVERED BY THE EVALUATION

This evaluation will only address those species and their habitats known or suspected to be within the anadromous fish-producing watersheds on all or part of 15 National Forests and seven BLM Districts in the four states. Those administrative units are:

Bureau of Land Management

State	BLM District
California	Bakersfield and Ukiah
Idaho	Coeur d' Alene and Salmon
Oregon	Prineville and Vale
Washington	Spokane

Forest Service

State	National Forest
California	Lassen and Los Padres
Idaho	Bitterroot, Clearwater, Nez Perce, Boise, Challis, Payette, Salmon, Sawtooth, and Sawtooth National Recreation Area
Oregon	Malheur, Ochoco, Umatilla, Wallowa-Whitman, and Columbia Gorge National Scenic Area
Washington	Okanogan (area outside of spotted owl habitat)

For a more specific description of the areas covered refer to the EA.

C. SPECIES CONSIDERED IN THIS EVALUATION

((E)-endangered, (T)-threatened, (P)-proposed, (CH)-critical habitat)

Species listed under the ESA are: Snake River sockeye salmon (Oncorhynchus nerka) (E,CH), Snake River fall and spring/summer chinook salmon (O. tschawytscha) (T,CH), Sacramento River winter chinook salmon (O. tschawytscha) (T,CH), northern bald eagle (Haliaeetus leucocephalus) (T/E), California condor (Gymnogyps californianus) (E), American peregrine falcon (Falco peregrinus anatum) (E), grizzly bear (Ursus actos) (T), gray wolf (Canis lupus) (E), MacFarland's four-o-clock (Mirabilis macfarlanei) (E), California least tern (Sterna antillarum browni) (E), least Bell's vireo (Vireo bellii pusillus) (E,CH), western snowy plover (Charadrius alexandrinus nivosus) (T), tidewater goby (Eucyclogobius newberryi) (E), unarmored threespine stickleback (Gasterosteus acleatus williamsoni) (E), salt marsh bird's beak (Cordylanthus maritimus ssp. maritimus) (E), marsh sandwort (Arenaria paludicola) (E), Gambels's water crest (Rorippa gambellii) (E), delta smelt (Hypomesus transpacificus) (T), California freshwater shrimp (Syncaris pacifica) (E), valley elderberry longhorn beatle (Desmocerus californicus dimorphus) (T), loch lemond coyote-thistle (Eryngium constancei) (E), Burke's goldfields (Lasthenia burkei) (E), southwestern willow flycatcher (Empidonax traillii extimus) (P), California redlegged frog (Rana aurora draytonii) (P), arroyo southwestern toad (Bufo microscaphus californicus) (P), California seablite (Sueda californica) (P), Sacramento splittail (Pogonichthys macrolepidotus) (P), vernal pool fairy shrimp (Branchinecta lynchi) (P), vernal pool tadpole shrimp (Lepidurus packardi) (P), California linderiells (Linderiella occidentalis) (P), Hoover's spurge (Chamaesyce hooveri) (P), pilose Orcutt grass (Orcuttia pilosa) (P), slender Orcutt grass (O. tenuis) (P), and Greene's tuctoria (Tuctoria greenei) (P). (NMFS and FWS species lists)

For a list of sensitive species, designated by the Agencies, see the FS Land and Resource Management Plans (LRMPs) and BLM Land Use Plans (LUPs)(collectively Plans) for the administrative units listed above. The programmatic nature of this evaluation does not warrant the listing of those species here.

D. LIMITATIONS OF THIS EVALUATION

The BE process was designed to evaluate the potential effects of site-specific activities on listed and sensitive species and their habitats. The process does not lend itself well to assessing potential effects of a programmatic decision. Potential, site-specific effects of implementing any of the alternatives, on any given species or habitat, will be evaluated in a second level project analysis. Therefore, the discussions in this BE will be qualitative, not quantitative.

E. POTENTIAL EFFECTS OF THE ALTERNATIVES ON LISTED AND PROPOSED SPECIES AND CRITICAL HABITAT

(For a full description of the alternatives, see the EA.)
The proposed action is to implement direction, on an interim basis, through the amendment of existing Plans, that would establish interim Riparian Habitat Conservation Areas (RHCAs) and standards and guidelines for managing resources within them. The RHCAs by definition would be applied to that part of a watershed needed to maintain the hydrologic, geomorphic, and ecological process of riparian ecosystems.

Implementation of the No Action Alternative would continue the direction outlined in the existing Plans. On a project by project basis, the

implementation of the current direction has the potential to affect listed and proposed species and/or designated critical habitat. Therefore, the implementation of the No Action Alternative would constitute a "may affect" under the ESA. Implementation of the four Action Alternatives, on a project by project basis, could lead to potential effects to listed and proposed species and/or designated critical habitats. Therefore, the implementation of the Action Alternatives would constitute a "may affect" under the ESA.

The four Action Alternatives would have less of an impact than the No Action Alternative due to the more constraining nature of the proposed interim direction. Due to the interim nature of the RHCAs and a lack of site-specific information, the relative degree of potential effects from the Action Alternatives is assumed to be inversely related to the constraints that would result from the implementation of proposed standards and guidelines, and the actions those constraints are applied. Therefore, Alternative 5, being the most constraining and applying to all ongoing and proposed actions, would have the least risk, followed by Alternatives 3 and 4, with Alternative 2 having the most risk.

F. POTENTIAL EFFECTS OF THE ALTERNATIVES ON SENSITIVE SPECIES

As stated above the criterion for evaluating potential effects to sensitive species are:

1. Would implementation of the alternatives result in a loss of viability or distribution throughout the planning area of the sensitive species; or
2. Would implementation of the alternatives move sensitive species toward federal listing under the ESA.

An assumption made here is that all regulations, policies, and direction of the Agencies would be followed with the implementation of any alternative. Therefore, none of the alternatives, if fully implemented, would fail to meet the two criterion. However, impacts to sensitive species could occur, to some extent, with the implementation of the alternatives. As with the listed species, specific impacts to a given sensitive species cannot be determined due to the programmatic nature of the interim direction.

Relative to the No Action Alternative, the Action Alternatives, with more constraining interim direction, would have potentially less impacts to sensitive species. Among the Action Alternatives, Alternative 5, being the most constraining and applying to the most actions, would have the least risk to sensitive species, followed by Alternatives 3 and 4, with Alternative 2 having the most risk.

Frank Bird 2/28/94
Frank Bird Date
Fisheries Biologist
U.S.D.I. Bureau of Land Management
Salmon, Idaho

Rick Roberts 2-28-94
Rick Roberts Date
Wildlife Biologist
U.S.D.A. Forest Service
Portland, Oregon

BIOLOGICAL ASSESSMENT
FOR THE

ENVIRONMENTAL ASSESSMENT FOR THE
INTERIM STRATEGIES FOR MANAGING ANADROMOUS
FISH-PRODUCING WATERSHEDS ON FEDERAL LANDS
IN EASTERN OREGON AND WASHINGTON, IDAHO,
AND PORTIONS OF CALIFORNIA

U.S.D.A. Forest Service and U.S.D.I. Bureau of Land Management

A. INTRODUCTION

This Biological Assessment (BA) analyzes the potential effects, from a programmatic standpoint, of Alternative 4 of the Environmental Assessment (EA) on species listed under the Endangered Species Act (ESA) and/or designated critical habitats. Implementation of Alternative 4 would result in amendments, on an interim basis, of Forest Service Land and Resource Management Plans (LRMPs) and BLM Land Use Plans (LUPs)(collectively Plans).

B. AREA COVERED BY THE ASSESSMENT

This BA will only address those species and their habitats known or suspected to be within the anadromous fish-producing watersheds on all or part of 15 National Forests and seven BLM Districts in the four states. Those administrative units are:

Bureau of Land Management

State	BLM District
California	Bakersfield and Ukiah
Idaho	Coeur d' Alene and Salmon
Oregon	Prineville and Vale
Washington	Spokane

Forest Service

State	National Forest
California	Lassen and Los Padres
Idaho	Bitterroot, Clearwater, Nez Perce, Boise, Challis, Payette, Salmon, Sawtooth, and Sawtooth National Recreation Area
Oregon	Malheur, Ochoco, Umatilla, Wallowa-Whitman, and Columbia Gorge National Scenic Area
Washington	Okanogan (area outside of spotted owl habitat)

For a more specific description of the areas covered refer to the EA.

C. SPECIES CONSIDERED IN THIS ASSESSMENT

(NMFS and FWS species list; (E)-endangered, (T)-threatened, (CH)-critical habitat)

Species listed under the ESA are: Snake River sockeye salmon (Oncorhynchus nerka) (E,CH), Snake River fall and spring/summer chinook salmon (O. tschawytscha) (T,CH), Sacramento River winter chinook salmon (O.

tschawytscha) (T,CH), northern bald eagle (Haliaeetus leucocephalus) (T/E), California condor (Gymnogyps californianus) (E), American peregrine falcon (Falco peregrinus anatum) (E), grizzly bear (Ursus actos) (T), gray wolf (Canis lupus) (E), MacFarland's four-o-clock (Mirabilis macfarlanei) (E), California least tern (Sterna antillarum browni) (E), least Bell's vireo (Vireo bellii pusillus) (E,CH), western snowy plover (Charadrius alexandrinus nivosus) (T), tidewater goby (Eucyclogobius newberryi) (E), unarmored threespine stickleback (Gasterosteus acleatus williamsoni) (E), salt marsh bird's beak (Cordylanthus maritimus ssp. maritimus) (E), marsh sandwort (Arenaria paludicola) (E), Gambels's water crest (Rorippa gambellii) (E), delta smelt (Hypomesus transpacificus) (T), California freshwater shrimp (Syncaris pacifica) (E), valley elderberry longhorn beatle (Desmocerus californicus dimorphus) (T), loch lemond coyote-thistle (Eryngium constancei) (E), and Burke's goldfields (Lasthenia burkei) (E).

Species proposed for Federal listing are: southwestern willow flycatcher (Empidonax traillii extimus), California redlegged frog (Rana aurora draytonii), arroyo southwestern toad (Bufo microscaphus californicus), California seablite (Sueda californica), Sacramento splittail (Pogonichthys macrolepidotus), vernal pool fairy shrimp (Branchinecta lynchi), vernal pool tadpole shrimp (Lepidurus packardi), California linderiells (Linderiella occidentalis), Hoover's spurge (Chamaesyce hooveri), pilose Orcutt grass (Orcuttia pilosa), slender Orcutt grass (O. tenuis), and Greene's tuctoria (Tuctoria greenei).

D. LIMITATIONS OF THIS ASSESSMENT

The BA process was designed to evaluate the potential effects of site-specific activities on listed species and their habitats. The process does not lend itself well to assessing potential effects of a programmatic decision. Potential, site-specific effects of implementing Alternative 4 on any given listed species or critical habitat, would be evaluated in second level project analyses. Therefore, the discussions in this BA will be qualitative, not quantitative.

E. DESCRIPTION OF ALTERNATIVE 4

Alternative 4 specifies riparian goals and riparian management objectives (RMOs); specifies standards and guidelines; provides Riparian Habitat Conservation Areas (RHCAs) with minimum interim widths (on each side of the stream) of 300 feet for anadromous fish bearing streams, 150 feet for permanent non-fish bearing streams, ponds, reservoirs, and wetlands greater than one acre, 100 feet in Key Watersheds (50 feet in non-Key Watersheds) for seasonally flowing or intermittent streams, wetlands less than one acre and landslides and landslide-prone areas; requires identification of Key Watersheds; and provides for Watershed Analysis. The standards, guidelines, procedures, and other requirements would apply to some high priority ongoing projects and activities, as well as proposed projects and activities, and projects and activities that have been decided but for which contracts or permits have not been issued. The high priority ongoing projects and activities would be identified as those determined, on a case-by-case basis, as having an unacceptable risk to species and/or habitats. See Appendix C of the EA for the specific standards and guidelines and the criteria for establishing the width of the RHCAs.

F. POTENTIAL EFFECTS OF ALTERNATIVE 4 ON LISTED SPECIES OR CRITICAL HABITAT

The proposed action is to implement direction, on an interim basis, through the amendment of existing Plans, that would establish interim Riparian Habitat Conservation Areas (RHCAs) and standards and guidelines for managing resources within them. The RHCAs by definition would be applied to that part of a watershed needed to maintain the hydrologic, geomorphic, and ecological process of riparian ecosystems.

Implementation of Alternative 4, on a project by project basis, could lead to potential effects to listed species. Due to the interim nature of the RHCAs, the constraining nature of the associated direction applied to activities within them, and the intent of improving habitat conditions for anadromous fish, the degree of potential direct and indirect effects, during the interim period, from Alternative 4 are considered to be insignificant.

The criteria for evaluating potential effects to designated critical habitat is whether or not the action would result in adverse modification or destruction of critical habitat. The programmatic nature of Alternative 4 does not allow for specific evaluation of effects. However, the implementation of Alternative 4 would have the potential to "may affect" any such critical habitats within the RHCAs, but would not result in the adverse modification or distruction of critical habitat.

G. POTENTIAL EFFECTS TO PROPOSED SPECIES

The question to be answered is whether or not the implementation of Alternative 4 would jeopardize the continued existence of the proposed species. Due to the interim nature of the RHCAs, the constraining nature of the associated direction applied to activities within them, and the intent of improving habitat conditions for anadromous fish, the implementation of Alternative 4 would not result in the jeopardy of any of the proposed species. The improvement of habitat conditions for anadromous fish would also result in improvement of habitat conditions for riparian dependent species.

H. INTERRELATED AND INTERDEPENDENT ACTIONS

There are no interrelated or interdependent actions associated with the implementation of Alternative 4.

I. CUMULATIVE EFFECTS

The proposed action is part of a large array of activities taking place throughout the range of anadromous fish, within the area covered by this analysis. In addition to Federal interests, private, state, and local interests are interspersed within the area which are essentially unregulated by federal agencies. The actions of private land owners include livestock management and timber management, mining, agriculture, recreation and private residences, and other commercial uses. The type of actions conducted or allowed by State agencies are similar to those on private lands. State agencies and a number of private land owners are taking positive steps to reduce potential impacts to listed species; however, it is impossible to estimate the potential cumulative effects

associated with these actions due to the interim nature of the proposed action.

J. DETERMINATION

We have determined that the implementation of Alternative 4, which would amend the Plans on an interim basis, would constitute a "may effect" to listed species and designated critical habitat within the anadromous fish producing watersheds covered by this analysis.

Frank Bird 2/28/94

Frank Bird Date
Fisheries Biologist
U.S.D.I. Bureau of Land Management
Salmon, Idaho

Rick Roberts 2-28-94

Rick Roberts Date
Wildlife Biologist
U.S.D.A. Forest Service
Portland, Oregon

PROPOSED FINDING OF NO SIGNIFICANT IMPACT

INTERIM ALTERNATIVES FOR MANAGING ANADROMOUS FISH-PRODUCING WATERSHEDS ON FEDERAL LANDS IN EASTERN OREGON AND WASHINGTON, IDAHO, AND PORTIONS OF CALIFORNIA

USDA Forest Service and USDI Bureau of Land Management
States of Oregon, Washington, Idaho, and California

The attached environmental assessment (EA) discusses in detail five alternative strategies for arresting the degradation and beginning the restoration of Pacific anadromous fish habitat (salmon, steelhead and sea-run cutthroat trout) on lands outside the range of the northern spotted owl which are administered by the Forest Service and the Bureau of Land Management [Hereinafter refered to as the "Agencies"] in Oregon, Washington, Idaho, and California. Over a period of 18 months, while environmental impact statements (EISs) are being prepared to develop longer-term management direction, the Agencies want to ensure that nothing done on public lands results in the extinction or further endangerment of at-risk anadromous fish stocks, or may otherwise preclude options that will be considered in the more geographically specific EISs.

The preferred strategy is Alternative 4, as fully developed and described in this EA on pages 12-18, 28, and in Appendix C. The interim direction prescribed under the Preferred Alternative provides management procedures and mitigation measures that would arrest the degradation and begin the restoration of aquatic and riparian habitat important to at-risk anadromous fish species. These mitigation measures do not authorize, fund, or carry-out any ground-disturbing activity but, rather, act to constrain future decisionmaking. Under Alternative 4, no additional mitigation measures would be taken during the interim period.

FINDING

We have determined that implementation of Alternative 4, as it is described and analyzed in the EA, would not constitute a major Federal action that would significantly affect the human environment. Therefore, an environmental impact statement will not be prepared. Our determination is based on the following factors:

The interim direction's effects would be limited in time and scope.

- The interim direction would be in effect until the analysis and adoption of a longer-term strategy are complete. Geographically specific EISs are being prepared to analyze and recommend longer-term strategies (pages 2, 5-11, 12). This process is scheduled to be completed in 18 months.

- The interim direction would affect only those projects within Riparian Habitat Conservation Areas that are (1) proposed for implementation during the interim period, and (2) ongoing projects which have been determined, on a case-by-case basis, to pose an unacceptable risk to aquatic and riparian habitat or at-risk anadromous fish stocks (p. 13, 16-18, and 28). The proposal area would involve a limited land base (see pages 12-14, 32-33, and Appendix B), despite the fact that all or parts of 15 national forests and 7 BLM districts in portions of 4 western States would be involved.

- Although the interim direction likely would cause small reductions in timber volume output, livestock grazing, and recreational uses, due to the short duration of the proposed action, such reductions would be within normal fluctuations. Further, opportunities to achieve outputs in later years would be maintained. Specific estimated effects on resource outputs are discussed on pages 62-65 of the EA.

- Because recovery processes within riparian and aquatic habitats are gradual, short-term adjustments in management practices may not result in dramatic ecosystem improvement (e.g. to aquatic habitat, watershed, or soil condition) during the interim period. However, adoption of the preferred alternative could arrest the degradation and begin important changes in management of habitat crucial to the survival of remaining anadromous fish populations while the EISs to analyze the longer-term strategy are being prepared (page 34-36).

- Because the proposed action would modify only certain activities and would be in effect only for a short time, we have concluded that no significant adverse or beneficial effects on the physical environment (pp. 40-42), biological environment (pp. 44-46, 48-49, 50-52, 53, and 54-55), or human environment (56-66) would occur.

No known unusual circumstances exist:

- Alternative 4 would not impose any highly uncertain, unique, or unknown environmental risks. The best available information provided the foundation for designing the proposed action (pp. 2-4, 8-10, and Appendix A). Adoption of measures similar to those described for the proposed action has become the accepted method of meeting the threatened and endangered anadromous fish habitat requirements (pp. 4-5).

- Newly proposed projects would be based upon compliance with NEPA and CEQ regulations (pp. 17-18).

- o No unique characteristics of the geographic area would be affected by the interim management direction contained in Alternative 4. Unique lands and resources that may be affected by the proposed action include: Wild and Scenic Rivers (p. 58), ecologically important plant communities such as are found in riparian areas (pp. 42, 46, 49, and 52), threatened, endangered, and sensitive species (p. 53), and Tribal heritage sites with archeological and religious importance (pp. 58-60). Such areas would be improved or maintained under the proposed action.

- o No adverse effects to any historic places or loss of scientific, cultural, or historic resources would occur as a result of interim direction (p. 57).

The interim direction would not produce any significant irretrievable, irreversible, or cumulative effects:

- o A biological evaluation (BE) and a biological assessment (BA) have been prepared for threatened, endangered, and sensitive species which potentially could be affected by the interim direction. The BE concludes that the interim direction prescribed under Alternative 4 would be unlikely to cause loss of species viability or move any sensitive species toward listing. The BA determined that Alternative 4 would constitute a "may affect" designation of listed species in designated critical habitat that is within the anadromous fish-producing watersheds considered in this assessment. Both documents are attached to the EA.

- o Biological diversity would not be significantly affected at the watershed, landscape, or regional levels. No adverse effects would be expected on prime farmlands, rangeland, forest land, flood plains, wetlands, or other ecologically critical areas (pp. 34-55).

- o The Agencies will complete consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service under provisions of the Endangered Species Act of 1973, as amended, on any interim direction prior to its adoption. Project-specific consultation and compliance with NEPA with appropriate documentation also would be conducted during the interim period, as needed (p. 17-18).

- o Potential cumulative effects are evaluated in the EA, and it has been determined that because of the limited time in which interim direction would apply, cumulative effects to the physical, biological, and human environment would not be significant. In addition, cumulative effects also would be limited by the nature of the interim direction itself. As analyzed in the EA on pages 37-55, interim direction would reduce effects on the physical and biological environment.

- Alternative 4 is not related to other actions with individually insignificant but cumulatively significant impacts. This determination was made by considering: (1) that the interim direction would be temporary, and (2) the nature of the action would result in fewer environmental effects than would be expected under direction provided under current forest plans and land use plans (pp. 5, 19, and 34-55).

- Public health and safety would not be significantly affected by the interim direction described under Alternative 4 (p. 56).

- The interim management direction described under Alternative 4 would not threaten to violate Federal, State, local, or Tribal laws, or requirements imposed for the protection of the environment (pp. 56-60).

- The selected alternative would not significantly affect consumers, civil rights, minority groups, or women. As discussed on pages 56-65, although consumers may be affected by reductions in timber output, livestock grazing, and recreational uses, such changes should be within normal market fluctuations. To the extent that job and income losses occur, they would not disproportionately affect minority groups and women.

The interim direction would not likely cause highly controversial environmental effects:

- The environmental effects resulting from interim direction described under Alternative 4 would not likely be highly controversial. Controversy in this context refers to cases where there is a substantial dispute as to the size, nature, or effect of the Federal action, rather than to opposition to its adoption. The scientific basis for this interim direction has been evaluated thoroughly through studies (see pp. 2-5, Appendix A, FEMAT and SAT reports). The declines of anadromous fish stocks and degradation of their associated freshwater habitat have not been disputed.

- Selection of Alternative 4 would not set a precedent for future actions likely to result in significant environmental effects, nor would it represent a decision in principle about any future considerations. The interim management direction described under Alternative 4 is based on some of the same scientific information used in the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (p. 5). The interim direction would be in effect only until longer-term direction can be developed in the more geographically specific EISs. Modifications to projects and activities authorized during the interim period may be necessary following completion of the EISs (p. 17-18).

- Tribal officials in the affected areas have expressed support in written communications and face-to-face meetings regarding the Agencies' joint watershed and ecosystem management proposal (see administrative records). The destruction of salmon and steelhead species has had severe social and cultural impacts on the Tribes. Indian Tribes are interested in working with the Agencies to restore and protect anadromous fish habitat. Nonetheless, beneficial effects would not be significant due to the short duration of interim direction, and because the amount of benefits received would be limited (p. 58-60).