

## APPENDIX A.

(EXCERPT FROM)

Biological Opinion  
for the  
EFFECTS TO BULL TROUT FROM CONTINUED IMPLEMENTATION OF LAND AND  
RESOURCE MANAGEMENT PLANS AND RESOURCE MANAGEMENT PLANS AS  
AMENDED BY THE INTERIM STRATEGY FOR MANAGING FISH-PRODUCING  
WATERSHEDS IN EASTERN OREGON AND WASHINGTON, IDAHO, WESTERN  
MONTANA, AND PORTIONS OF NEVADA (INFISH), AND THE INTERIM STRATEGY  
FOR MANAGING ANADROMOUS FISH-PRODUCING WATERSHEDS IN EASTERN  
OREGON AND WASHINGTON, IDAHO, AND PORTIONS OF CALIFORNIA (PACFISH).

### INTRODUCTION

The U.S. Fish and Wildlife Service (Service) has reviewed the biological assessment (BA) addressing effects to the threatened bull trout (*Salvelinus confluentus*) from continued implementation of U.S. Forest Service (USFS) Land and Resource Management Plans (LRMPs) and Bureau of Land Management (BLM) Resource Management Plans (RMPs) as amended by the Interim Strategy for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada (INFISH: USDA and USDI 1995a) and the Interim Strategy for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH: USDA and USDI 1995b). A June 15, 1998 request for consultation from the USFS and BLM was received on June 16, 1998. Activities administered by the USFS are carried out under the existing direction of LRMPs. BLM activities are administered under the direction of RMPs or Management Framework Plans. For convenience, all plan documents are referred to in this document as LRMPs.

This document represents the Service's biological opinion (BO) on the effects of continued implementation of the LRMPs as amended by PACFISH and INFISH on listed bull trout in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA)(16 U.S.C. 1531 et seq.). This BO is based on the information provided in the June 15, 1998 BA (USDA and USDI 1998a) and a June 19, 1998 letter amending the BA (USDA and USDI 1998b). In the BA, the USFS and BLM determined that the action is not likely to jeopardize the continued existence of the listed species, but that it may affect and likely adversely affect the bull trout. No critical habitat has been designated for this species, therefore, none was determined to be affected.

In addition to the information contained in the BA, the best available information from several other sources was used in this analysis. A list of those sources is included in Appendix 1. A complete administrative record of this consultation is on file in the Service's Oregon State Office, 2600 S.E. 98th Avenue, Suite 100, Portland, Oregon 97266.

The BA and transmittal letter also requested consultation on the effects of the LRMPs on proposed critical habitat for the Lost River (*Deltistes luxatus*) and shortnose suckers (*Chasmistes brevirostris*). However, the Service, USFS and BLM subsequently agreed to confine this opinion to bull trout, and evaluate the effects to proposed critical habitats for the two sucker species in a separate conference opinion to be prepared at a later date. In addition, the analysis in the BA addressed the effects of the LRMPs on the Jarbidge River population of bull trout, which was proposed for listing as threatened on June 10, 1998 (USDI 1998b). Conferencing on bull trout for this DPS will also be addressed in a separate conference opinion.

In a separate plan-level programmatic BO, the Service is providing similar analyses of the effects of continued implementation of the USFS LRMPs and BLM RMPs, as amended by the Northwest Forest Plan Record of Decision (USDA and USDI 1994).

## **BACKGROUND/CONSULTATION HISTORY**

The bull trout was proposed for listing as threatened in the Columbia River Basin and endangered in the Klamath River Basin on June 13, 1997 (USDI 1997). The final rule listing the Klamath and Columbia River Basin distinct population segments (DPSs) of bull trout as threatened was published on June 10, 1998 (USDI 1998a). The effective date of the listing was July 10, 1998.

Section 7 regulations (50 CFR ' 402.16) require reinitiation of formal consultation where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and a new species is listed or critical habitat designated that may be affected by the action. This BO addresses the effects of continued implementation of the LRMPs as amended by PACFISH and INFISH standards and guidelines where listed DPSs of bull trout occur in Idaho, Montana, Oregon, and Washington.

## **II. BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

Recent decisions by the USFS and BLM have resulted in the addition of interim aquatic strategies to LRMPs within the geographic range of the Columbia and Klamath River bull trout DPSs. Forests and BLM Districts with anadromous fish have modified their LRMPs either through amendment (USFS) or instruction memorandum (BLM) by the PACFISH. The USFS, through the INFISH, amended LRMPs where PACFISH was not already in place. The BLM, via instructional memoranda, applied INFISH direction to bull trout watersheds. The agencies also consult on site-specific actions conducted under the direction of the LRMPs that may affect listed species. This BO addresses LRMPs, as modified by PACFISH and INFISH, for the Columbia and Klamath River bull trout DPSs. Additional features of the proposed action were provided by letter dated June 19, 1998 (USDA and USDI 1998b) and considered as part of the proposed action. Among the DPSs, this BO considers the effects to bull trout from 24 USFS and 16 BLM LRMPs in the states of Washington, Oregon, Idaho, Montana, and Nevada.

## Purpose and Function of LRMPs

Within the range of the DPSs of bull trout, LRMPs provide direction and standards for broad classes of project activities and land and water management practices that may affect bull trout. LRMPs provide policy guidance for various federal activities carried out on the forest or management area. While all of the USFS and BLM administrative units implement many of the same land-use practices, the level of activities and outputs will vary depending on local conditions. Although LRMPs set important parameters for authorization of specific projects, with some exceptions, LRMPs do not themselves authorize the projects. Actual authorization of projects depends on analysis of site-specific effects, and consistency with appropriate management direction and applicable legal requirements.

The action area encompasses all or parts of the following National Forests (NF) of the USFS, and Resource Areas (RA) of the BLM for the Columbia River and Klamath River DPSs of bull trout (USDA and USDI 1998a). These are:

Agency	DPS	Administrative unit (region or state)
USFS	Columbia River	Colville NF, Deschutes NF, Malheur NF, Ochoco NF, Okanogan NF, Umatilla NF, Wallowa-Whitman NF, Wenatchee NF, and Columbia River Gorge National Scenic Area (Pacific Northwest Region); Bitterroot NF, Clearwater NF, Flathead NF, Helena NF, Kootenai NF, Lolo NF, Beaverhead-Deerlodge NF, Idaho Panhandle NF, Nez Perce NF (Northern Region); Boise NF, Payette NF, Salmon-Challis NF, Sawtooth NF (Intermountain Region)
	Klamath River	Fremont NF, Winema NF (Pacific Northwest Region)
BLM	Columbia River	Baker RA, Central Oregon RA, Deschutes RA, Three Rivers RA, Malheur RA, Border RA, Wenatchee RA, (Washington-Oregon); Cascade RA, Cottonwood RA, Emerald Empire RA, Shoshone RA, Big Butte RA, Lemhi RA, Challis RA (Idaho); Garnet RA (Montana)
	Klamath River	Klamath Falls RA (Washington-Oregon)

LRMPs provide direction and standards for a large variety of projects and types of activities, including forest management, recreation, range management, mining, watershed restoration, fish and wildlife habitat management, fire and fuels management, land exchanges and acquisitions, and a variety of special uses. Specific actions associated with these program activities are described below.

Forest management generally consists of two categories of activities: timber harvest and associated actions, and silvicultural treatments used to develop desirable stand characteristics.

Timber harvest and associated actions can include: road construction, landing construction, renovation and use, including quarry operation; yarding and skidding logs; clear-cutting or thinning treatments; salvage of dead or dying trees, and maintenance of existing roads. Road maintenance includes surface maintenance (blading), surface replacement, drainage maintenance and repair, vegetation management (brushing, limbing, seeding and mulching along roadways), slide repair, sign maintenance and repair, and maintenance, replacement and repair of major structures (bridges and major culverts). Silvicultural treatments include planting, prescribed burning, plantation maintenance and release (density management, precommercial thinning and control of competing vegetation), animal damage control, and fertilization.

Recreation consists of activities that provide for a wide range of developed and dispersed recreational opportunities. Developed recreation actions include campground maintenance, and recreation site and trail construction/maintenance. Dispersed activities include general public use of Federal lands (hunting, fishing, camping, hiking, etc), environmental education, and management of off-highway vehicles.

Range management activities on Federal lands include livestock grazing, and rangeland improvements (fencing, water development, livestock handling facilities, and vegetation management). Noxious weed control programs may be implemented in association with range management or other actions, such as silvicultural treatments.

Mining consists of two broad categories based on the method of extraction. Surface mining includes dredging, dispersed gold panning, and pit mining while underground mining utilizes tunnels or shafts to extract minerals. Activities associated with mining include roads and supporting structures and facilities, hazardous chemicals, water use and treatment.

Watershed restoration actions on Federal lands are an integral part of management to aid in the recovery of watershed health and water quality. Road decommissioning, road drainage improvement, surfacing, culvert upgrades, and sediment source stabilization through seeding and planting are typical restoration actions.

Fish and wildlife management actions on Federal lands may include stream and riparian habitat surveys; surveys for fish (smolt traps, snorkling, spawning ground counts, electrofishing), amphibians, and fish habitat projects such as direct habitat improvements to increase habitat complexity, riparian planting, channel and bank stabilization, and fish passage improvements. Typical wildlife management activities include winter range burning, access management, snag management, tree topping and falling, and water developments.

Fire and fuels management actions include the suppression of wildfire and prescribed fire used to meet resource management objectives. Prescribed burning is used for fuels management for wildfire hazard reduction (underburning), restoration of desired vegetation conditions, management of habitat and silvicultural treatments, i.e., site preparation (broadcast burning or pile burning). Pump chances, or water withdrawal sites, are created as water sources for fire suppression. Usually located next to roads, these sites are typically small excavated ponds or short spurs for vehicle access to streams or lakes.

Land exchanges and acquisitions are made to benefit a variety of uses and values. Land tenure adjustments are made to improve public access, acquire important habitats or resources and improve the efficiency of managing Federal lands.

Because Federal lands are a source of forest products for domestic and commercial uses, a variety of special uses occur on Federal lands. Some products include Christmas trees, firewood, mushrooms, ferns, boughs, mosses and similar products. Both the USFS and BLM administrative units issue permits for the collection of these products.

The USFS and BLM also issue a variety of permits for the use of Federal lands. Permits may be issued for utility and powerline corridors, communications sites, domestic and municipal water lines and diversions, and hydroelectric facilities. Road use permits are issued to allow for the transportation of commercial commodities on FS and BLM managed roads. Road right-of-ways are issued to private individuals and companies for the construction and use of access roads across Federal lands.

Because a wide variety of activities and projects are directed by the amended LRMPs, and many of these require interdisciplinary team development, watershed analysis, compliance with the National Forest Management Act (NFMA) and National Environmental Policy Act (NEPA) and other analysis and documentation before they can proceed, it is not the Service's intent to fully evaluate effects of individual projects in this BO. This BO focuses primarily (and necessarily quite broadly) on the land management direction, standards and guidelines (S&Gs), objectives, assumptions, and major components of LRMPs, PACFISH and INFISH ACS components, and individual LRMP standards that may affect bull trout. Individual projects that may affect bull trout are subject to Endangered Species Act requirements, and will be addressed as agreed to in the January 27, 1998 letter of direction.

### **Amended LRMP Direction For PACFISH and INFISH**

PACFISH and INFISH provide programmatic direction for management of lands administered by the USFS and BLM. Both are interim strategies intended to provide protection against extinction or further endangerment of fish stocks and to maintain long-term management options, such as those being considered by the Interior Columbia Basin Ecosystem Management Project (ICBEMP) Draft Environmental Impact Statement.

PACFISH and INFISH share similar goals, objectives, standards, and guidelines, which are collectively considered the ACS. For PACFISH, management direction is applied to all proposed and ongoing management activities for the mitigation of environmental effects relative to the ACS. Seven general components of the ACS are:

1. Establish riparian goals and objectives to maintain and restore fish habitat.
2. Delineate Riparian Habitat Conservation Areas (RHCAs).
3. Establish standards and guidelines for the management of RHCAs.
4. Establish criteria and process to designate key watersheds.
5. Establish criteria and process to guide watershed analysis.
6. Emphasize the need for watershed restoration actions

7. Establish requirements for effectiveness and implementation monitoring.

Similar components are included in INFISH. However, application of PACFISH and INFISH strategies differs between the USFS and BLM. For the USFS, the strategies are amended to regional guides and LRMPs, whereas the BLM addresses the strategies through instruction memoranda for individual states.

### **LRMP Protections that Exceed Plan Standards**

Some USFS and BLM administrative units had existing LRMP management direction specific to aquatic resources that was more stringent than that contained in the INFISH and PACFISH ACS. Based on USDA and USDI (1998a), the majority of the National Forests (16) reported standards and guidelines or specific management direction that were more stringent than those provided by amendment with the ACS. These specific measures came about either through actions implemented to benefit other threatened, endangered or sensitive species, such as salmon and grizzly bear, or specific standards for aquatic habitat management. The majority of the BLM administrative units that responded to requests indicated no specific standards or guidelines more stringent than exists in LRMPs amended by the aquatic strategies. Those BLM units reporting more restrictive management guidelines (4) indicated they were a result of specific management area plans prior to the implementation of the ACS and measures brought about through consultation for listed salmon stocks.

### **ACS Strategy - Components and Objectives**

The ACS strategy includes aspects designed to provide for protection of aquatic species and their habitats.

1. Riparian Goals--Riparian goals establish an expectation of the 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 goals encompass both aquatic and terrestrial processes. 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; and
  - (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; and
- (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.

2. Riparian Management Objectives (RMOs)--In the development of PACFISH, 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. Applicable published and unpublished scientific literature was 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 6th order streams).

This material was reviewed in regard to its applicability to inland native fish. It has been determined that the RMOs described in PACFISH are good indicators of ecosystem health. The analysis that led to development of the RMOs involved watersheds in Oregon, Washington, and Idaho that include inland native fish as well as anadromous fish. With the exception of the temperature objective, which has been modified, the RMOs represented a good starting point to describe the desired condition for fish habitat.

Under INFISH, these interim RMOs apply where watershed analysis has not been completed. The components of good habitat can vary across specific geographic areas. Interim RMOs are considered to be the best watershed scale information available; Federal land managers are encouraged to establish site-specific RMOs through watershed analysis or site-specific analysis.

RMOs should be refined to better reflect conditions that are attainable in a specific watershed or stream reach based on local geology, topography, climate, and potential vegetation. Establishment of RMO's requires completion of watershed analysis to provide the ecological basis for the change. However, interim RMOs may be modified by amendment in the absence of watershed analysis where watershed or stream reach specific data support the change. In all cases, the rationale supporting RMOs and their effects are documented.

The interim RMOs for stream channel conditions provide the criteria against which attainment or progress toward attainment of the riparian goals is measured. Interim RMOs provide the target toward which managers aim as they conduct resource management activities across the landscape. It is not expected that the objectives would be met instantaneously, but rather would be achieved over time. However, the intent of interim RMOs is not to establish a ceiling for what constitutes good habitat conditions.

In addition, interim RMOs are meant to lead to watershed specific RMOs developed through watershed analysis. Actions that reduce habitat quality, whether existing conditions are better or worse than objective values, would be inconsistent with the purpose of this interim direction. Without the benchmark provided by measurable RMOs, habitat may suffer continual erosion.

As indicated below, some of the objectives would apply to only forested ecosystems, some to non-forested ecosystems, and some to all ecosystems regardless of whether or not they are forested. Objectives for relevant environmental features have been identified, including one key feature and five supporting features. These features are good indicators of ecosystem health, are quantifiable, and are subject to accurate, repeatable measurements. They generally apply to 3rd to 6th order watersheds.

Under the ACS, interim RMOs would apply to watersheds occupied by anadromous and inland native fish. Application of the interim RMOs would require thorough analysis. That is, if the objective for an important feature such as pool frequency is met or exceeded, there may be some latitude in assessing the importance of the objectives for other features that contribute to good habitat conditions. For example, in headwater streams with an abundance of pools created by large boulders, fewer pieces of large wood might still constitute good habitat. The goal is to achieve a high level of habitat diversity and complexity through a combination of habitat features to meet the life-history requirements of the fish community inhabiting a watershed. Specific RMOs address pool frequency that varies by channel width, water temperature, large woody debris, bank stability, lower bank angle, and stream width/depth ratio, as examples.

3. Riparian Habitat Conservation Areas (RHCAs)--Interim RHCAs would be delineated in every watershed on USFS and BLM lands within the geographic range of bull trout. RHCAs are portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific S&Gs. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams; (2) providing root strength for channel stability; (3) shading the stream; and (4) protecting water quality (Naiman et al. 1992).

The RHCAs under the ACS strategy would be nearly identical to those under the Idaho Conservation Strategy (Idaho Department of Fish and Game (IDFG) 1995). The main difference is that, under the Idaho Conservation Strategy, RHCAs would apply only in key watersheds. However, since their key watersheds are large and cover much of the National Forest System lands in Idaho, there would be little difference between the two Strategies in regard to RHCAs in Conservation Areas within occupied bull trout habitat.

Widths of interim RHCAs that are adequate to protect streams from non-channelized sediment inputs should be sufficient to provide other riparian functions, including delivery of organic matter and woody debris, stream shading, and bank stability (Brazier and Brown 1973, Gregory et al. 1984, Steinblums et al. 1984, Beschta et al. 1987,

McDade et al. 1990, Sedell and Beschta 1991, Belt et al. 1992). The effectiveness of riparian conservation areas in influencing sediment delivery from non-channelized flow is highly variable. A review by Belt et al. (1992) of studies in Idaho (Haupt 1959a, 1959b; Ketcheson and Megehan 1996; Burroughs and King 1985, 1989; and elsewhere (Trimble and Sartz 1957, Packer 1967, Swift 1986) concluded that non-channelized sediment flow rarely travels more than 300 feet and that 200-300 foot riparian "filter strips" are generally effective at protecting streams from sediment from non-channelized flow.

Interim RHCA widths apply where watershed analysis has not been completed. Site-specific widths may be increased where necessary to achieve riparian management goals and objectives, or decreased where interim widths are not needed to attain RMOs or avoid adverse effects. Establishment of RHCAs would require completion of watershed analysis to provide the ecological basis for the change. However, interim RHCAs may be modified by amendment in the absence of watershed analysis where stream reach or site-specific data support the change. In all cases, the rationale supporting RHCA widths and their effects are documented.

The standard widths of interim RHCAs fall into four categories of stream or water bodies:

*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;
- d. for Priority 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 Priority 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 categories 1 and 2 is the extent of the 100-year flood plain.

4. Standards and Guidelines C S&Gs of the ACS apply to all RHCAs and to projects and activities in areas outside of RHCAs that would degrade conditions in RHCAs. The S&Gs address ten management issues in RHCAs and associated areas: timber management, roads management, grazing management, recreation management, minerals management, fire and fuels management, lands, general riparian area management, watershed and habitat restoration, and fisheries and wildlife restoration.

### Timber Management

TM-1. Prohibit timber harvest, including fuelwood cutting, in RHCAs, except as described below. Do not include RHCAs 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 in RHCAs only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects on listed anadromous fish can be avoided. For watersheds with listed salmon or designated critical habitat, complete Watershed Analysis prior to salvage cutting in RHCAS.

- b. Apply silvicultural practices for RHCA to acquire desired vegetation characteristics where needed to attain RMOs. Apply silvicultural practices in a manner that does not retard attainment of RMOs and that avoids adverse effects on listed anadromous fish.

### 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 RMOs.
- RF-2. For each existing or planned road, meet the RMOs and avoid adverse effects on listed anadromous fish by:
  1. completing Watershed Analyses prior to construction of new roads or landings in RHCA.
  - b. minimizing road and landing locations in RHCA.
  - c. initiating development and implementation of a Road Management Plan or a Transportation Management Plan. At a minimum, address the following items in the plan:
    1. Road design criteria, elements, and standards that govern construction and reconstruction.
    2. Road management objectives for each road.
    2. Criteria that govern road operation, maintenance, and management.
    4. Requirements for pre-, during-, and post-storm inspections and maintenance.
    2. Regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives.
    3. Implementation and effectiveness monitoring plans for road stability, drainage, and erosion control.
    4. Mitigation plans for road failures.
  - d. avoiding 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.

5. Route road drainage away from potentially unstable stream channels, fills, and hillslopes.
  - e. avoiding disruption of natural hydrologic flow paths.
  2. avoiding sidecasting of soils or snow. Sidecasting of road material is prohibited on road segments within or abutting RHCAs in watersheds containing designated critical habitat for listed anadromous fish.
- RF-3. Determine the influence of each road on the RMOs. Meet RMOs and avoid adverse effects on listed anadromous fish by:
- a. reconstructing road and drainage features that do not meet design criteria or operation and maintenance standards, or that have been shown to be less effective than designed for controlling sediment delivery, or that retard attainment of RMOs, or do not protect designated critical habitat for listed anadromous fish from increased sedimentation.
  - b. prioritizing reconstruction based on the current and potential damage to listed anadromous fish and their designated critical habitat, the ecological value of the riparian resources affected, and the feasibility of options such as helicopter logging and road relocation out of RHCA.
  - c. closing and stabilizing or obliterating, and stabilizing roads not needed for future management activities. Prioritize these actions based on the current and potential damage to listed anadromous fish and their designated critical habitat, and the ecological value of the riparian resources affected.
- RF-4. Construct new, and improve existing, culverts, bridges, and other stream crossings to accommodate a 100-year flood, including associated bedload and debris, where those improvements would/do pose a substantial risk to riparian conditions. Substantial risk improvements include those that do not meet design and operation maintenance criteria, or that have been shown to be less effective than designed for controlling erosion, or that retard attainment of RMOs, or that do not protect designated critical habitat from increased sedimentation. Base priority for upgrading on risks to listed anadromous fish and their designated critical habitat and the ecological value of the riparian resources affected. Construct and maintain crossings 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.

### Grazing Management

- GM-1. Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of RMOs or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting RMOs and avoiding adverse effects on listed anadromous fish.
- GM-2. Locate new livestock handling and/or management facilities outside of RHCA. For existing livestock handling facilities inside the RHCA, assure that facilities do not prevent attainment of RMOs or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met.
- GM-3. Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent attainment of RMOs or adversely affect listed anadromous fish.
- GM-4. Adjust wild horse and burro management to avoid impacts that prevent attainment of RMOs or adversely affect listed anadromous fish.

### Recreation Management

- RM-1. Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of the RMOs and avoids adverse effects on listed anadromous fish. Complete Watershed Analysis prior to construction of new recreation facilities in RHCA. For existing recreation facilities inside RHCA, assure that the facilities or use of the facilities will not prevent attainment of RMOs or adversely affect listed anadromous fish. Relocate or close recreation facilities where RMOs cannot be met or adverse effects on listed anadromous fish avoided.
- RM-2. Adjust dispersed and developed recreation practices that retard or prevent attainment of RMOs or adversely affect listed anadromous fish. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective in meeting RMOs and avoiding adverse effects on listed anadromous fish, eliminate the practice or occupancy.
- RM-3. Address attainment of RMOs and potential effect on listed anadromous fish and designated critical habitat in Wild and Scenic Rivers, Wilderness, and other Recreation Management plans.

### Minerals Management

- MM-1. Avoid adverse effects to listed species and designated critical habitat from mineral operations. If the Notice of Intent indicates a mineral operation would be located in a RHCA, or could affect attainment of RMOs, or adversely affect listed anadromous fish, require a reclamation plan, approved Plan of Operations (or other such governing

document), and reclamation bond. For effects that cannot be avoided, such plans and bonds must address the costs of removing facilities, equipment, and materials; recontouring disturbed land to near pre-mining topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvage and replacement of topsoil; and seed bed preparation and revegetation to attain RMOs and avoid adverse effects on listed anadromous fish. Ensure Reclamation Plans contain measurable attainment and bond release criteria for each reclamation activity.

MM-2. Locate structures, support facilities, and roads outside RHCAs. Where no alternative to siting facilities in RHCAs exists, locate and construct the facilities in ways that avoid impacts to RHCAs and streams adverse effects on listed anadromous fish. Where no alternative to road construction exists, keep roads to the minimum necessary for the approved mineral activity. Close, obliterate and revegetate roads no longer required for mineral or land management activities.

MM-3. Prohibit solid and sanitary waste facilities in RHCAs. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in RHCA exists, and releases can be prevented and stability can be ensured, then:

3. analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.
4. locate and design the waste facilities using the 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 RHCA.
- c. monitor waste and waste facilities to confirm predictions of chemical and physical stability, and make adjustments to operations as needed to avoid adverse effects to listed anadromous fish and to attain RMOs.
5. reclaim and monitor waste facilities to assure chemical and physical stability and revegetation to avoid adverse effects to listed anadromous fish and to attain the RMOs.
- e. require reclamation bonds adequate to ensure long-term chemical or physical stability and successful revegetation of mine waste facilities.

MM-4 For leasable minerals, prohibit surface occupancy within RHCA 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 RMOs can be attained and adverse effects to listed anadromous fish can be avoided. Adjust the operating plans of existing contracts to (1) eliminate impacts that prevent attainment of RMOs and (2) avoid adverse effects to listed anadromous fish.

MM-5 Permit sand and gravel mining and extraction within RHCA only if no alternatives exist, if the action(s) will not retard or prevent attainment of RMOs, and adverse effects to listed anadromous fish can be avoided.

MM-6 Develop inspection, monitoring, and reporting requirements for mineral activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to eliminate impacts that prevent attainment of RMOs and avoid adverse effects on listed anadromous fish.

### Fire/Fuels Management

FM-1. Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of RMOs, 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 actions could perpetuate or be damaging to long-term ecosystem function, listed anadromous fish, or designated critical habitat.

FM-2. Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of RHCA. If the only suitable location for such activities is within the RHCA, 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, with avoidance of adverse effects to listed anadromous fish a primary goal. Use an interdisciplinary team, including a fishery biologist, to predetermine incident base and helibase locations during pre-suppression planning, with avoidance of potential adverse effects to listed anadromous fish a primary goal.

FM-3. Avoid delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following a review and recommendation by a resource advisor, and a fishery biologist, when the action agency determines an escape fire would cause more long-term damage to anadromous fish habitats than chemical delivery to surface waters.

FM-4. Design prescribed burn projects and prescriptions to contribute to the attainment of the RMOs.

FM-5. Immediately establish an emergency team to develop a rehabilitation treatment plan to attain RMOs and avoid adverse effects on listed anadromous fish whenever RHCA are significantly damaged by a wildfire or a prescribed fire burning out of prescription.

### Lands

LH-1. Require instream flows and habitat conditions for hydroelectric and other surface water development proposals that maintain or restore riparian resources, favorable channel conditions, and fish passage, reproduction, and growth. Coordinate this process with the appropriate State agencies. During relicensing of hydroelectric projects, provide written and timely license conditions to the Federal Energy Regulatory Commission (FERC) that

require fish passage and 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 RHCA. For existing ancillary facilities inside the RHCA that are essential to proper management, provide recommendations to FERC to assure that the facilities will not prevent attainment of the RMOs and that adverse effects on listed anadromous fish are avoided. Where these objectives cannot be met, provide recommendations to FERC that such ancillary facilities should be relocated. Locate, operate, and maintain hydroelectric facilities that must be located in RHCA to avoid effects that would retard or prevent attainment of the RMOs and avoid adverse effects on listed anadromous fish.
- LH-3. Issue leases, permits, rights-of-way, and easements to avoid effects that would retard or prevent attainment of the RMOs and avoid adverse effects on listed anadromous fish. Where the authority to do so was retained, adjust existing leases, permits, rights-of-way, and easements to eliminate effects that would retard or prevent attainment of the RMOs or adversely affect listed anadromous fish. 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 effects that would prevent attainment of the RMOs or adversely affect listed anadromous fish. Priority for modifying existing leases, permits, rights-of-way, and easements will be based on the current and potential adverse effects on listed anadromous fish and the ecological value of the riparian resources affected.
- LH-4. Use land acquisition, exchange, and conservation easements to meet RMOs 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. Trees may be felled in RHCA 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 that does not retard or prevent attainment of RMOs and avoids adverse effects on listed anadromous fish.
- RA-4. Prohibit storage of fuels and other toxicants within RHCA. Prohibit refueling within RHCA unless there are no other alternatives. Refueling sites within a RHCA must be approved by the USFS or BLM and have an approved spill containment plan.

RA-5. Locate water drafting sites to avoid adverse effects to listed anadromous fish and instream flows, and in a manner that does not retard or prevent attainment of RMOs.

#### Watershed and Habitat Restoration

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

WR-2. Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans (CRMPS) or other cooperative agreements to meet RMOs.

WR-3. Do not use planned restoration as a substitute for preventing habitat degradation (i.e., use planned restoration only to mitigate existing prob not to mitigate the effects of proposed activities).

#### Fisheries and Wildlife Restoration

FW-1. Design and implement fish and wildlife habitat restoration and enhance actions in a manner that contributes to attainment of the RMOs.

FW-2. Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of the RMOs or adversely affect anadromous fish. For existing fish and wildlife interpretive and other user-enhancement facilities inside RHCA assure that RMOs are met and adverse effects on listed anadromous fish are avoided. Where RMOs cannot be met or adverse effects on listed anadromous fish avoided, relocate or close such facilities.

FW-3. Cooperate with Federal, Tribal, and State wildlife management agencies to identify and eliminate wild ungulate impacts that prevent attainment of RMOs or adversely affect listed anadromous fish.

FW-4. Cooperate with Federal, Tribal, and State fish management agencies to identify and eliminate adverse effects on native anadromous fish associated with habitat manipulation, fish stocking, fish harvest, and poaching.

5. Key and Priority Watersheds--Key and priority watersheds are important to "at risk" fish. These watersheds are considered to be currently in good condition, or have a high potential for restoration. Both key (PACFISH) and priority watersheds (INFISH) are equivalent in the ACS relative to bull trout.

In both PACFISH and INFISH, the ACS is designed to conserve fish populations by protecting and recovering aquatic habitat on Federal lands. All watersheds with listed anadromous fish or critical habitat for listed anadromous fish are designated as key watersheds in the PACFISH area. Therefore, the key watershed designations due to

Federal listings under ESA include the Snake River salmon and steelhead Evolutionarily Significant Units (ESUs) and the Upper Columbia River steelhead ESU. The Middle Columbia River portion of the PACFISH area has no Federally listed anadromous fish, thus no key watershed designations. The INFISH priority watersheds were designated to protect and conserve inland native fish habitat and populations, although a priority was extended to bull trout populations within the INFISH area. As a result of this prioritization, priority watersheds are only located where bull trout are currently distributed.

The key or priority watershed networks were established for the conservation of habitat for anadromous fish or resident fish, specifically Federally listed salmon ESUs and bull trout populations for the PACFISH and INFISH, respectively. An analysis of the key and priority watershed networks within the DPSs or specific analysis areas addressed in the BA found the Federal land designated as key or priority watersheds ranges from 0 to 41 percent. The Columbia River and Klamath River bull trout DPSs have 41 and 20 percent of the Federal land designated as key or priority watersheds within their range, respectively.

6. 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.

Generally, watershed analysis would be initiated where the interim RMOs and the interim RHCAs widths do not adequately reflect specific watershed capabilities, or as required in the S&Gs before specific projects are initiated. The guidelines and procedural manuals being developed by the Interagency Watershed Analysis Coordination Team and other potentially relevant procedures (e.g., the Cumulative Watershed Effects Process for Idaho, etc.) would be considered and used, where appropriate, in development of a watershed analysis protocol. Eventually, any watershed analysis would follow the final guidance on *A*Ecosystem Analysis at a Watershed Scale, Federal Guide for Watershed Analysis (often referred to as the *A*Federal Guide@: USDA et al. 1995). Currently there are two memoranda available (dated November 1, 1995 and October 16, 1996) that include new information and modules to be used. In addition, there is a draft riparian module (February 1997) specific to intermittent streams, but which suggests use also on perennial streams. At this time, the modules that accompany the Federal Guide are optional and USFS and BLM units often opt to use different techniques of analysis, depending on their time frames and budgets for analysis.

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 RHCAs and for RMOs. Watershed analysis can form 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, depending upon the issues to be addressed in the watershed analysis. 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 carrying out land use activities within a geomorphic context, and is a major component of the evolving science of ecosystem analysis.

Watershed analysis consists of a sequence of activities designed to identify and interpret the processes operating in a specific landscape. Since the concept of watershed analysis was first introduced, there has been much discussion as to the procedures and detail that a watershed analysis should complete. Under the Northwest Forest Plan, watershed analysis has been conducted, and there are varying levels of analysis completed in those analyses. It is recognized that the components and intensity of the analysis would vary depending on level of activity and significance of issues involved. Following are the general process steps for watershed analysis:

1. Characterization of the Watershed.
  - a. Place the watershed in a broader geographic context.
  - b. Highlight dominant features and processes within the watershed.
2. Identification of Issues and Key Questions.
  - a. Key questions and resource components.
  - b. Determine which issues are appropriate to analyze at this scale.
3. Description of Current Condition.
4. Description of Reference Conditions.
  - a. Establish ecologically and geomorphically appropriate reference conditions for the watershed.
5. Interpretation of Information.
  - a. Provide a comparison and interpretation of the current, historic, and reference conditions.
6. Recommendations.
  - a. Provide conclusions and recommendations to management.

The process described above is significantly streamlined to allow managers to focus watershed analysis to address specific issues and management needs. This can include modification of RMOs, RHCAs, or identification of restoration and monitoring needs. The state-of-the art for watershed analysis is still developing and the processes are flexible.

7. 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.

The approach did not attempt to develop a restoration strategy given the short time period for implementation of the interim direction in the ACS. It was expected that land

managers would utilize the information from watershed analysis and project development to initiate restoration projects where appropriate and funds were available. Priority watersheds have the highest priority for restoration efforts.

8. Monitoring--Monitoring is an important component of the INFISH and PACFISH interim direction. The primary focus is to verify that the S&Gs are applied during the project implementation.

Monitoring to assess whether protective measures are effective to attain riparian goals and management objectives has been considered a lower priority given the initial, short time frame for the interim direction of the ACS. Complex ecological processes and long time frames are inherent in the RMOs, and that type of monitoring would not likely generate conclusive results within the initial 18 months the ACS was to be in place. Nevertheless, monitoring is a critical to component of the ACS. Land managers have been urged to utilize current monitoring efforts, and section 7 monitoring results from PACFISH areas where on the same land management unit to establish a baseline for determining the effectiveness of these S&Gs. Priority watersheds have the highest priority for monitoring efforts.

A third type of monitoring (validation monitoring) is intended to ascertain the validity of the assumptions used in developing the interim direction. Because of the initial, short-term nature of the management direction, no specific requirements were included in the ACS for validation monitoring.

### **Summary of Management Area Categories**

Each LRMP describes the level of goods and services provided with implementation. There is considerable variability between plans as to the level of production. Even within a single plan the range of goods and services is expected to vary with budget and natural changes in the capability of the land. In order to display the total level of goods and services represented by all the LRMPs in the BA, some of the geographic information system data themes developed for the ICBEMP Plan were used (USDA and USDI 1998a). The Management Area Categories (MACs) layer was developed for BLM and USFS lands within the project area in an effort to provide a consistent display of management direction and support assessing the overall effects on the ecosystem. The focus of the categories is to describe existing management direction. These categories were used to display current conditions and assess effects of planned management activities to the species covered in this assessment. Potential roadless areas and predicted road density data layers were also used as another indicator of management activity.

The eight MACs identified are:

1. Natural, Unmodified Environments
2. Special Natural Areas
3. Essentially Unmodified Forested and Grassland Ecosystems
4. Natural Appearing, but Modified for Human Use and Occupancy
5. Modified Forest Ecosystems

6. Modified Rangelands
7. Areas Modified by Human Occupation and Activities
8. Modified Non-Sustainable Areas

For the analysis in the BA, the eight categories were collapsed into three areas of management activities: Undeveloped Areas, categories 1, 2, and 3; Developed Areas, categories 4, 5, and 6; and Highly Developed Areas, categories 7 and 8. In order to assess effects, the management activity areas were then compared against species presence, represented by known strong and depressed populations of bull trout in the three DPSs. Bull trout were also compared against potential roadless areas, areas having no or very low predicted road density in contiguous blocks greater than 5,000 acres in size, and predicted road density categories.

### **Monitoring and Adaptive Management Provisions**

A specific monitoring plan was developed as a part of the PACFISH decision (PACFISH Record of Decision, Appendix E-1 through E-12). This monitoring strategy was framed around three aspects of monitoring: 1) implementation monitoring to determine if the S&Gs are followed; 2) effectiveness monitoring to see if the implementation of S&Gs achieved the desired goals and objectives; and 3) validation monitoring to determine if there is a cause-and-effect relationship between management activities and the fish habitat being managed. A proposal for effectiveness monitoring was submitted by technical staff to the Regional Executives of the USFS and BLM in June of 1995. The Regional Executives chose not to implement the effectiveness or validation monitoring portion of the plan. They did, however, recommend to the ICBEMP science team the effectiveness portion of the PACFISH plan for consideration in the ICBEMP monitoring package. An interagency implementation monitoring network was established in 1995 and was comprised of technical staff and line officers for the BLM, USFS, Service, and National Marine Fisheries Service (NMFS). Summary reports and individual site visit information are available for 1995, 1996, and 1997. The 1996 and 1997 PACFISH review also included a limited review of some INFISH areas.

The INFISH decision also stressed the importance of monitoring to ensure proper implementation and effectiveness of the S&Gs in the aquatic strategy. Instead of establishing a specific monitoring strategy, the Forests were "urged to utilize current Forest Plan monitoring efforts, and Section 7 monitoring results from PACFISH areas where on the same Forest..." (INFISH Record of Decision, Appendix A-15). A special request to the Forests for their monitoring results was initiated in January 1995. This request went to all INFISH Forests and was the only coordinated gathering of monitoring data for INFISH for all USFS units. In 1996, the Northern Region of the USFS requested monitoring data of its Forests and this data is also available. A similar request was not made in USFS Pacific Northwest and Intermountain Regions. No coordinated gathering of monitoring data was made for the BLM.

Provisions for adaptive management are not specifically addressed in either PACFISH or INFISH. Although existing data and data generated from forest plans and section 7 activities may be available for evaluation, the action does not provide for monitoring the efficacy or evaluating assumptions of activities implemented pursuant to the action. Moreover, the action does not provide a framework for identifying areas of uncertainty concerning management

activities, formulating testable hypotheses, generating additional data for performing tests of hypotheses, and evaluating the results of the tests relative to the management activities.

### **Additional Agency Commitments**

In a letter to the Service, the USFS and BLM adopted commitments in implementing the ACS and requested that they be amended to the BA for this action(USDA and USDI 1998b). The Service has included the commitments in developing this BO and they are summarized below:

1. Restoration and improvement: The USFS and BLM, in cooperation with the NMFS and the Service, will develop and implement strategies that will integrate and coordinate restoration, protection and evaluation measures (construction/maintenance, flood repair, watershed, and fish habitat improvements, etc.) to expeditiously achieve restoration objectives at multiple scales (DPS, metapopulation, watershed). Restoration opportunities will be identified through an agreed upon approach using existing funding, information and programs, and incorporating new information as it becomes available. Initial strategy development will be completed by March 1, 1999.
2. Standards and guidelines: The USFS and BLM will complete prior commitments in the PACFISH and INFISH decisions, and use the conclusions in the PACFISH/INFISH reviews and the land management plan BA for bull trout and suckers.

Prior commitments to be emphasized are:

- a. Road evaluation and Planning (PACFISH and INFISH) standards RF-2 and RF-3). Implementation of these existing standards in PACFISH/INFISH is necessary to understand and begin reducing impacts from roads on streams with habitat for ESA listed and proposed fish. Achievement of PACFISH/INFISH RF-2 and RF-3 will be a priority.
  - i) Using existing information and road definitions, the Service will be provided with road inventories on the management units in the three bull trout DPSs within 120 days of BO signature. This information should include a description of road definitions and survey methodology used. Information gaps will be identified and a schedule will be developed to provide information to the Service within two years.
  - ii) As part of watershed analyses, road inventories, and other appropriate information will be used to collaborate with NMFS and Service in developing restoration strategies. Restoration strategies will be used to identify key processes needing attention, prioritize key locations and project types, address implementation and scheduling issues and provide a preliminary estimate of costs. These strategies will serve as the primary framework for implementation of integrated restoration activities.
  - iii) continue updating the road inventories. Incorporate new information consistent with 2.a.i. (above).

- b. To complete the commitments made in the aquatic strategies for culvert replacement, fish passage, grazing facilities in RHCAs, recreation facilities, and minerals management the implementation of these existing standards in PACFISH/INFISH are necessary to understand and begin reducing impacts from these management activities on streams with habitat for ESA listed and proposed fish. Achievement of PACFISH/INFISH RF-4 and RF-5, GM-2, RM-1, and MM-2 will be a priority.
3. Key and priority watershed networks: reexamine the structure and function of INFISH priority and PACFISH key watershed networks to ensure the protection and recovery of bull trout and listed sucker metapopulations.
  - a) Identify and clarify the primary functions of key, priority, and special emphasis watershed.
  - b) Identify special emphasis watersheds (within 60 days of BO signature) to ensure a comprehensive refugia network for the protection and recovery of bull trout and listed suckers.
  - c) Completing watershed analysis in existing INFISH priority watersheds, and special emphasis watersheds as identified in 3b above, is a priority (required in PACFISH and INFISH standards, TM-1, RF-2, RM-1). Project decisions will be guided by the results of watershed analysis.
  - d. Priorities and schedules for watershed analysis will be developed concurrently with #1 (above) and updated annually.
4. Watershed analysis: Watershed analysis will be conducted according to *Ecosystem Analysis at the Watershed Scale*, Field Guide for Watershed Analysis, 1995, as updated (USDA et al. 1995). In general watershed analysis will not be project-driven but undertaken to generate an information base and recommendations for use in project planning.
5. Monitoring: To improve monitoring efforts, to make the level of monitoring commensurate with the level of on-the-ground activities, and to provide feedback on the effects of activities, the USFS and BLM will develop a mechanism for improved monitoring accountability and oversight. Interagency collaboration in the development of this mechanism is necessary to ensure a common understanding of expectations.
  - a. Consider NMFS= expectations for monitoring in the 1995 LRMP Opinion (section IX.I. and Appendix A-10), when updating the PACFISH monitoring strategy.
  - b. Activate the PACFISH interagency effectiveness monitoring subgroup including areas covered by INFISH, (within 120 days of signature) to develop a monitoring strategy including a range of monitoring alternatives commensurate with anticipated land management activity levels, funding, and staffing levels.
  - c. Incorporate INFISH areas into PACFISH implementation monitoring efforts.

d. Improve the current implementation monitoring process by expanding regional/state level USFS/BLM line officer involvement in PACFISH/INFISH implementation oversight and review.

6. Long-term Conservation and Recovery: USFS and BLM will use their authorities in carrying out programs for the conservation of endangered and threatened species as consistent with section 7(a)(1) of ESA.

a. Using PACFISH, INFISH, watershed analysis and other information, develop a conservation approach to protect and restore existing high quality habitats and the connectivity between them. The USFS and BLM will review existing roadless and low density areas (as defined in ICBEMP science assessment team) to assess their importance to listed species habitat.

b. As a foundation for the development of a long-term conservation and recovery strategy, the USFS and BLM will develop a mechanism for improved accountability and oversight to ensure PACFISH and INFISH direction is fully implemented. Interagency collaboration in the development of this mechanism is necessary to ensure a common understanding of expectations.

1. Provide a mechanism (within 120 days of signature), that ensures full implementation of programmatic aquatic conservation measures at all organizational levels for the bull trout and sucker species addressed in the BA.

2. Provide a strategy which will be used if funding or priorities prevent full implementation of the aquatic conservation measures. Annually, upon receipt of the initial budget, review the fiscal year priorities and program of work for attainment of fish conservation measures. Identify highest priority work for available funds and identify and document significant shortfalls in funding or staffing.

7. The USFS and BLM, in coordination with the Service, will complete section 7 consultation at the watershed level by May 1999. The watershed consultation will follow the approach agreed to in the January 27, 1998, letter of direction on bull trout conferencing, with modifications as agreed to by the agencies. After the effective date of the bull trout listing, and until the watershed consultations are completed, all ongoing and proposed actions must conform to INFISH and PACFISH guidelines and these seven commitments.

**The entire Biological Opinion is on file at the Fish and Wildlife Service, Snake River Fish and Wildlife Office, 1387 South Vinnell Way, Boise, Idaho 83709**

