Watershed and Aquatic Ecosystems

Proposed Forest Plan Supporting Documents

Nez Perce National Forest

February 2007

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Links to other supporting documentation:

Link to Gordon Reeves (2003) science review and references cited:

http://www.reo.gov/library/acs/ - Link to FEMAT website and scientific references:

PACFISH/INFISH Crosswalk List of PACFISH AND INFISH goals, standards, guidelines, biological opinion direction, and definitions compared with forest plan components.

Basin, subbasin, watershed, and subwatershed - Hydrologic boundaries within National Forest boundary.

Subwatershed (10 to 50 square mile area) - Listing of subwatershed names and number of Forest service managed acres.

Subwatershed summaries – Contain a list organized by subwatershed of the physical and biological existing conditions, risk and threats assessment, and needed actions. Helps answer the questions: "What are the existing conditions? What work needs to be done? And how do you know when watershed restoration is achieved?"

Conservation and restoration definition – Describes the process used to stratify forest subwatersheds into conservation and restoration management themes for broad scale planning purposes.

Species diversity assessment – Aquatic species status assessments including threatened and endangered species, species-of-concern, and species-of-interest.

Watershed and Aquatic Monitoring program - Draft monitoring design to track progress towards meeting desired conditions.

IDEQ Integrated §303(d)/§305(b) Report 2005

- Section 1) Water of the State attaining all standards
- Section 2) Waters of the State attaining some (most) standards
- Section 3) Waters of the State with insufficient data and information to determine if any standards are attained
- Section 4a and Section 4c) Impaired or threatened for one or more standards but not needing a TMDL
- Section 5) TMDL needed.

Incorporating Source Water Protection into the Planning and Projects

Idaho Wellhead Protection Plan

EPA Region 10 Source Water Protection Best Management Practices for USFS, BLM

Water Rights by Category and Ownership - Points of diversion within the National Forest boundary

Introduction

The forest plan is the watershed and aquatic species conservation strategy for the Nez Perce National Forest. Watershed and aquatic ecosystem strategic direction is provided in the plan in the form of 5 plan components: desired conditions, objectives, suitability of uses, special areas, and project guidelines.

The overall purpose of the watershed and aquatic ecosystem conservation strategy is the integration of upland and aquatic resource management direction to 1) conserve physical and biological processes and that result in stream channel, riparian and upland vegetation conditions and patterns that reflect a historic range of disturbance patterns; and 2) improve watershed and aquatic ecosystems where the cumulative effects of past land uses combined with natural disturbances have interrupted expected water flow regimes and physical processing of sediment, and have compromised biological integrity. How we plan on achieving that restoration outcome is described in this forest plan.

Much of our past management direction focused on prescriptive standards to protect resources. This forest plan describes in detail the desired features of those watershed and aquatic resources, and then charts a course of action to achieve those conditions. Associated monitoring program (included in the plan set of documents) describes how we will track and report our progress toward meeting desired conditions stated in the plan. Supporting documentation are the data and processes used by the forest resource specialists in developing the forest plan and associated reports.

The intent of this supporting documentation is to provide an understanding of the forest plan watershed and aquatic species conservation strategy. This information may also provide some useful background information in developing project proposals to meet forest plan desired conditions.

This introduction provides a brief description of that supporting documentation and links or references to related documents.

Forest plans and the aquatic conservation strategy contained within provides guidance for sustaining aquatic ecosystems and contributing to the diversity of native aquatic species. The framework for this guidance is within the plan desired conditions. The desired conditions identify and describe selected aquatic ecosystem characteristics. These desired conditions are specifically described at the appropriate temporal and spatial scales (Table 1). Providing or contributing towards diversity of native aquatic species depends on two assumptions. These are:

1. the populations respond to corresponding changing habitat conditions, and
2. no permanent population extirpations occur as a result of allowing their natural variation under historic disturbance regimes.

A long and convoluted process has been established to evaluate ecosystem and species diversity, and subsequently ecological sustainability. The story starts long, long ago in the interior Columbia basin.

The Interior Columbia Basin Strategy

In 2002, executives for the Forest Service, Bureau of Land Management, Fish and Wildlife Service, Environmental Protection Agency, and National Marine Fisheries Service signed an Interagency Memorandum of Understanding (MOU). The purpose of this MOU was to cooperatively implement 'The Interior Columbia Basin Strategy' to guide the amendment and revision of forest and resource area land management plans throughout the Interior Columbia Basin. Within this strategy was specific guidance for aquatic and riparian conservation. It identified six components addressing aquatic and riparian management to be incorporated into forest plans. The six components are:

- Riparian conservation areas
- Protection of population strongholds
- Multi-scale analysis
- Restoration priorities and guidance
- Management direction
- Monitoring adaptive management

Each of these six components was incorporated into the revised forest plan.

Riparian Conservation Areas

Riparian protection guidance was first institutionalized in the Northwest Forest Plan in 1993. The aquatic conservation strategy defined *riparian reserves* in chapter 5. In 1995, Nez Perce National Forest plan was amended to identify Riparian Habitat Conservation Areas with associated goals, objectives and standards. The science behind those definitions is still valid, and further supported in the literature.

Reeves (2003) reviewed the scientific literature since Forest Ecosystem Management Assessment Team (FEMAT 1993) and reported key science findings on the topics of: (1) ecosystem and landscape dynamics and the range of natural variation (RNV); and (2) the ecological role of headwater streams. These concepts have also been reviewed and considered in the development of the Nez Perce National Forest revised forest plan. As a result of this review, the revision forests have retained the *riparian reserves* definitions but renamed them *riparian conservation areas.* The name change denotes the need to manage riparian areas to conserve the processes and resulting patterns that provide the desired aquatic ecological conditions supporting riparian dependant species. *Riparian conservation areas* are defined as portions of watersheds where riparian-dependent resources receive primary emphasis and where specific desired conditions, suitability, and project guidance applies. (See forest plan glossary for complete definitions and delineations). Each management direction contained within PacFish or InFish management guidance and accompanying Biological Opinion was reviewed and incorporated into the revised forest plan as appropriate (See PACFISH/INFISH Crosswalk).

Forest Ecosystem Management Assessment Team (FEMAT). 1993. Forest ecosystem management: an ecological, economic, and social assessment. Report of the Forest Ecosystem Management Assessment Team. U.S. Government Printing Office 1993-793-071. Link to FEMAT website and scientific references: http://www.reo.gov/library/acs/

Protection of Population Strongholds

Plans identify subwatersheds of value for protection of populations of listed and proposed aquatic species and narrow endemics. These are the high priority conserve and restore designated subwatersheds. The intent is that strongholds will provide high quality habitat for species, and support expansion and recolonization of species to adjacent subwatersheds. These areas should conserve key processes likely to influence the persistence of populations or metapopulations (Rieman and Dunham 2000).

Much work has already been done in delineating strongholds (e.g., recovery plans, ICB documents, and PACFISH/INFISH key and priority watershed maps). Nearly all of the forest's subwatersheds are within a key or priority subwatershed designation. In general, plan components provide the ecological conditions forest-wide that support species' subpopulations and contribute to their conservation and recovery. Management direction emphasizes achieving or maintaining the riparian and aquatic values, including key processes, for which they are being managed. Additional protections for population strongholds are provided through plan components for wilderness areas, wild and scenic rivers, areas without roads, low road density, and research natural areas.

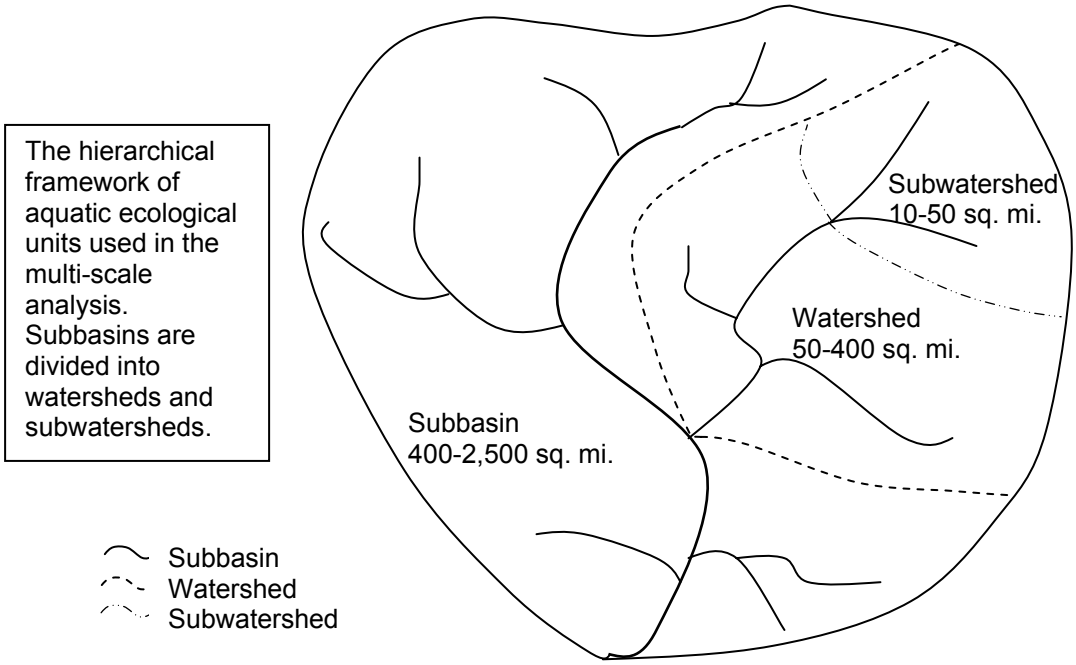
Quigley and Arbelbide (1997) An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins, Volume III (PNW-GTR-405, 1997): An Ecosystem Approach to Salmonid Conservation (NFMS TR-4501-96-6057, 1996) p1264, 1354-1368;

Rieman, B.E., and Dunham, J.B., Ecology of Freshwater Fish 2000: 9: 51-64

Multi-Scale Analysis

Multi-scale analysis provides a basis for integration and prioritization of conservation measures for wide-ranging species. The basis is context. Multi-scale analysis results displays to managers and decision makers the consequences of local decisions on the populations as a whole. For instance, the Nez Perce National Forest may provide the largest concentration of spawning Pacific lamprey in the entire upper Columbia River.

The forest plan watersheds and aquatic ecosystems desired conditions were developed as a result of multi-scale analysis. Analysis scale followed the Hierarchy Framework of Aquatic Ecological Units in North America (Maxwell et. al 1995). The four analysis scales are: basin, subbasin, watershed, and subwatershed. The smallest scale land unit used in this analysis was the subwatershed (10 to 50 square mile area). This subwatershed data was aggregated up to the watershed (50 to 400 square mile area) and subbasin (400 to 2,500 square mile area) to develop the aquatic habitat and watershed desired conditions. This multi-scale analysis incorporated information from numerous data sources such as subbasin assessments, species recovery plans, watershed analysis, Total Maximum Daily Load (TMDL) program assessments and implementation plans or other broad- or mid-scale information. Subsequent project decisions would incorporate updated data summarized at the subwatershed scale to determine the progress toward meeting desired conditions at the watershed and subbasin scales (See subwatershed summaries).



The Aquatic Multi-scale Assessment and Planning Framework was developed by the Rocky Mountain Research Station to help aquatic practitioners organize, document, and use natural resource data for assessing and designing management actions to protect, maintain and restore aquatic resources. This multi-scale assessment and planning framework is a 6 step planning tool that has been used in plan revision efforts throughout Regions 1 and 4. The planning framework consists of the following steps.

Step 1 - Describe the existing condition and distribution of native fish populations, watershed conditions, and water quality.

Step 2 - Describe the desired condition for native fish population status and distribution, aquatic habitats and watersheds.

Step 3 - Identify risks and threats that influence native fish populations, aquatic habitats and watershed conditions.

Step 4 - Assess various influences on and interactions between watershed conditions, aquatic habitats, native fish and other aquatic associated species.

Step 5 - Develop restoration strategies for aquatic resources.

Step 6 - Develop monitoring plans.

Restoration Priorities and Guidance

The forest plan identifies conservation and restoration priorities in desired conditions (Chapter 1) and objectives (Chapter 2). Additional specific guidelines for supporting

watershed conservation and restoration can be found in Chapter 3, Design Criteria. Assigning restoration priorities was a two step process. First, an expert panel of hydrologists and fisheries biologists from the Nez Perce and Clearwater National Forests evaluated and assigned each subwatershed with a conserve or restore designation based upon current physical watershed and stream conditions. Second, priorities were assigned to each subwatershed based upon the biological condition or its inherent potential. For further information on definitions and assessment results, see conservation and restoration definition and species diversity assessment. For detailed subwatershed physical and biological data, risk and threat assessments, and needed action to accomplish restoration see subwatershed summaries.

Management Direction

Forest plan provides management direction that identifies qualitative and quantitative desired outcomes and conditions for aquatic resources (see Table 1). Plan sets management sideboards to assure that actions implementing plans are consistent with, and contribute to achieving, those desired outcomes and conditions. Relevant elements include:

- Water quality (temperature, fine sediment, nutrients),
- Habitat access,
- Habitat elements (substrate, pools, large woody debris, refugia),
- Channel condition and dynamics (channel width or width/depth, stream bank stability),
- Flow/hydrology (flow regime),
- Watershed conditions (disturbance regimes), and
- Riparian vegetation.

The forest plan includes appropriate suitable uses, objectives, and activity-specific guidelines that support conserving or achieving those desired conditions. These management direction were developed from a large pool of local and regional data sources (Table 2).

Monitoring and Adaptive Management

Forest plan monitoring program will (1) determine if a plan is being implemented correctly and is achieving desired results, (2) provide a mechanism for accountability and oversight, (3) evaluate the effectiveness of recovery and restoration efforts, and (4) provide a feedback loop so that management direction may be evaluated and modified. Forest plan includes key evaluation and monitoring questions by topic area that inform decision making and allow adjustments to management. It will be important to monitor

Table 1. Watersheds and aquatic ecosystem desired conditions summary is displayed by appropriate assessment scale and aquatic conservation theme.

Desired Condition	**HUC5**	**HUC6**		**Project or Reach**	
Aquatic Theme:		Conserve	Restore	Conserve	Restore
Water/Sediment Balance	2 yr recovery post disturbance	2-4 yr recovery post disturbance		2-5 yr recovery post disturbance	
Sediment Yield		Breaklands 30% (peak year) every 10-25 yrs; Uplands 40% every 40-60 yrs		≤ 5% (chronic)	≤ 10% (chronic)
Peak Flow		≤ 20%			
Road Density	≤ 1mi/mi^2	≤ 1 mi/mi^2	≤ 3 mi/mi^2		
RCA Road Density		≤ 1 mi/mi^2	≤ 2 mi/mi^2		
LSP Road Density		≤ 1 mi/mi^2			
Water Quality	Meets designated or existing beneficial uses				
Water Quantity	Meets consumptive and non-consumptive needs				
Floodplain and Channel Maintenance	High flows exceed bankfull discharge 3 out of 5 yrs.				
RCA Vegetation	Condition reflects natural disturbance processes				
RCA Disturbance				0 %	≤ 5%
RCA Standing Dead Trees				> 20/ac	
RCA Dead and Down Trees				> 50 tons/ac	
Habitat Connectivity	Access to all historically accessible habitat				
Water Temperature Cold Water Biota				Max ≤ 22°C; MDA≤19°C	
Water Temperature Salmonid Spawning				Max ≤ 13°C; MDA≤9°C	
Water Temperature Bull Trout				MWMT Jun, Jul, Aug ≤19°C; MDA Sep-Oct ≤9°C	
Pool Frequency				1 per 5 to 7 channel widths in pool-riffle stream reaches; 1 per 4 channel widths in step-pool stream reaches	
Pool Size, Maximum Depth, and Cover				Quality rating ≤ 4 in alluvial streams	
Width to Depth Ratio				Confined channel ≤ 10; mod. confined ≤ 20; Unconfined ≤ 40	
Channel Substrate Condition				Spawning fines ≤ 20%; embeddedness ≤ 30%	
Large Wood Debris		Near natural patterns of size and amount in channel, stream banks and floodplain			
Bank Stability				C channel types ≥ 90%; A, B, E channels ≥ 95%;	
Aquatic Species	Populations are self-sustaining and well distributed				
Aquatic Species	Spatial disturbance is less than occupied SOC subpopulation				

the key parameters to the degree necessary to support the current course of action or to trigger an alternate approach. See Watershed and Aquatic Monitoring program for a list of evaluation questions and draft recommended watershed and aquatic ecosystem monitoring program.

Table 2. Data sources from which plan components were developed.

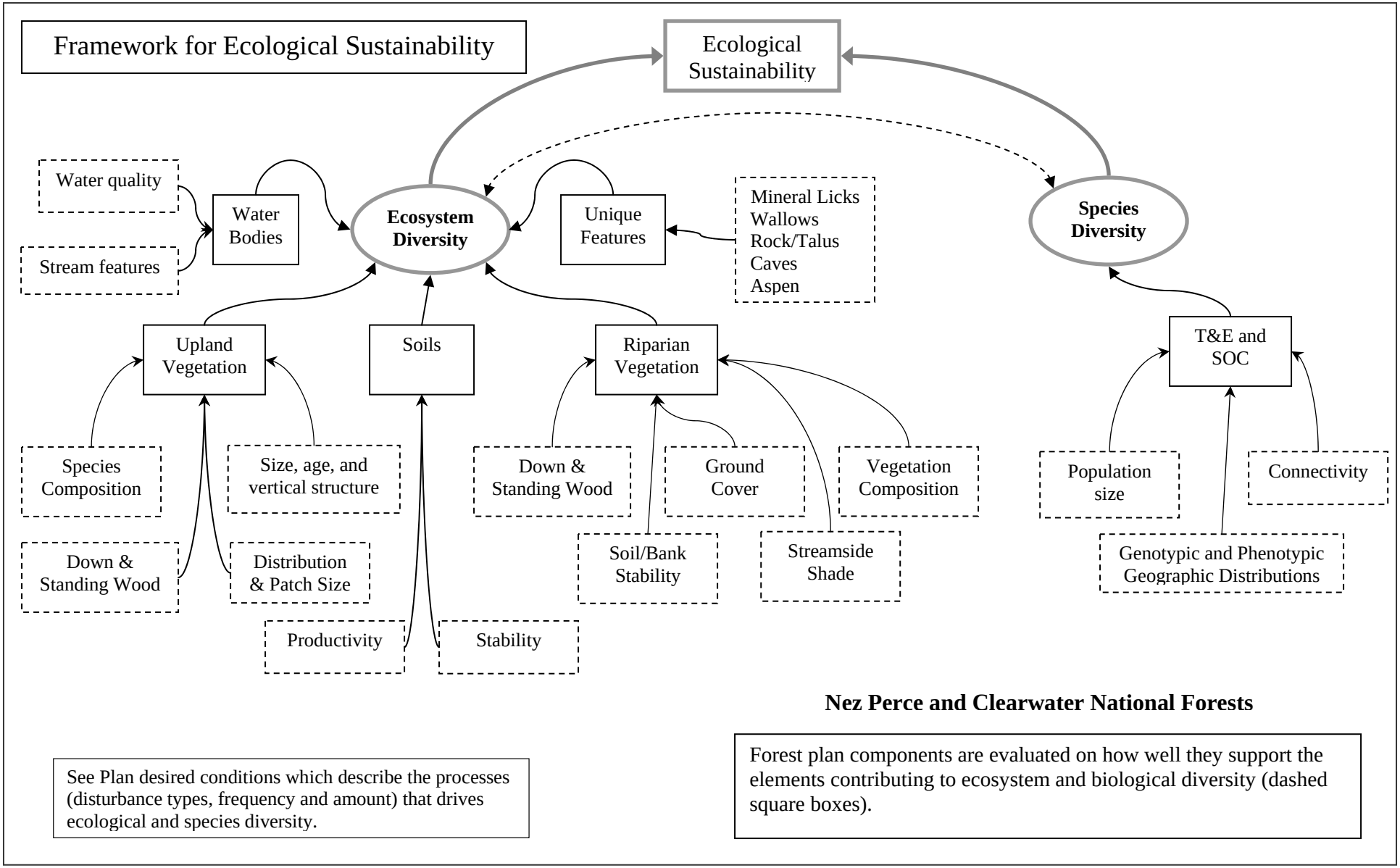
Data Sources	Data Description	Data Age
Forest Inventory and Assessment (FIA)	Vegetation data	2000 - 2002
Subbasin assessments	Watershed and fisheries conditions	1997 - 2006
Northwest Power Planning and Conservation Council Subbasin Plans	Watershed and fisheries conditions	2000 - 2006
Watershed assessments	Watershed and fisheries conditions	1997 - 2006
Stream inventory data	Stream habitat, fish distribution	1990 - present
1987 Forest Plans	Management direction	1987
PACFISH and INFISH Environmental Assessments	Conservation and management direction	1995
Matrix of Pathways and Indicators of Watershed Condition for Chinook, Steelhead and Bull Trout	Local Interagency (USFS, NMFS, BLM, USFWS) agreement on desired stream habitat and watershed conditions	3/9/1998
Forest Plan Monitoring Reports	Annual accomplishments and trends	1988 - 2005
Biological Opinions	Conservation measures	1996 - present
Biological Assessments	Watershed and fisheries conditions	1995 - present
Bull Trout Recovery Plan (draft)	Management direction	2004
INFRA databases	Watershed conditions	Updated annually
State of Idaho Conservation Data Center	Status and conservation measures	Updated annually
Nature Serve	Species Status	Updated annually
ICBEMP	Broad scale status and methods	1997
Interior Columbia River Basin Technical Recovery Team	Salmon and steelhead population identification and status	Ongoing
Idaho Department of Fish and Game	Species distribution and status	Updated annually
Department of Environmental Quality	2002 Integrated Report and stream inventory	Updated biannually
Professional Peer Panel	Individual professional judgments	2003 - present
Nez Perce Tribe	Species distribution and status	Updated annually
Peer reviewed literature	Published	Varies

Ecological Sustainability

Region 1 – Ecological sustainability definition for Aquatic Resources:

> Full array of ecosystem characteristics, both biological and physical characteristics are maintained across the landscape and are resilient to natural levels of disturbance (representation).
>
> Disturbance will not eliminate all occurrences or distribution of a characteristic and may help to maintain some characteristics (resiliency).
>
> Self-sustaining populations and metapopulations provides for genetic and phenotypic diversity. Metapopulations and habitat redundancy provide for continued existence beyond disturbance events.

Forest plan desired conditions and objectives were developed and integrated across resource areas with the intent to conserve or restore aquatic ecosystems biological processes and functions. Each plan component can be evaluated to determine its contribution to ecosystem or species diversity. Spatial representation of plan components contribution to ecosystem or species diversity, and overall ecological sustainability is displayed in the following decision tree diagram. See Watershed and Ecological Sustainability report for detailed description of linkage between plan components and ecosystem and biological diversity.


Framework for Ecological Sustainability
Ecological Sustainability
Water quality
Stream features
Water Bodies
Ecosystem Diversity
Unique Features
Mineral Licks
Wallows
Rock/Talus
Caves
Aspen
Species Diversity
Upland Vegetation
Soils
Riparian Vegetation
T&E and SOC
Species Composition
Size, age, and vertical structure
Down & Standing Wood
Ground Cover
Vegetation Composition
Population size
Connectivity
Down & Standing Wood
Distribution & Patch Size
Soil/Bank Stability
Streamside Shade
Genotypic and Phenotypic Geographic Distributions
Productivity
Stability
Nez Perce and Clearwater National Forests
See Plan desired conditions which describe the processes (disturbance types, frequency and amount) that drives ecological and species diversity.
Forest plan components are evaluated on how well they support the elements contributing to ecosystem and biological diversity (dashed square boxes).

Water Quality

The current strategy is to assure that the Nez Perce National Forest management actions contribute to fully supporting existing and designated beneficial uses by providing water of appropriate quality.

Approximately 1,150 miles of stream segments[1] within the Nez Perce National Forest have been listed as impaired or not meeting standards by the Idaho Department of Environmental Quality (IDEQ Integrated §303(d)/§305(b) Report 2005). IDEQ has determined that those lakes and stream segments do not meet water quality standards for their designated and beneficial uses. The report consists of five sections:

Section 1) Water of the State attaining all standards
Section 2) Waters of the State attaining some (most) standards
Section 3) Waters of the State with insufficient data and information to determine if any standards are attained
Section 4a and Section 4c) Impaired or threatened for one or more standards but not needing a TMDL
Section 5) TMDL needed.

Past forest achievements meant to improve conditions include riparian plantings to increase streamside shade; erosion control by decommissioning and re-constructing streamside roads, culvert replacement or removal, riparian area fencing, and mining reclamation (see related aquatic strategies). *Total Maximum Daily Load* (TMDL) assessments have been completed or are under development and are used as guidance to improve impaired conditions (Table 3).

Table 3. Displayed by subbasin are the TMDL assessment report status and the action items identified in the subsequent implementation plans necessary to meet TMDL requirements.

Subbasin	TMDL Status Assessment	Number of Implementation Plan (IP) Actions Identified
Middle Salmon River, Chamberlain	EPA approved assessment and TMDL in 2003	Implementation underway. Stream shade targets as canopy cover percentages.
Little Salmon River	Scheduled for 2005 completion	Implementation plan to be developed
Lower Salmon River	Scheduled for 2007 completion	Implementation plan to be developed
South Fork Clearwater River	EPA approved assessment and TMDLs in 2004	Implementation plan under development
Lower Selway River	Assessment completed in 2000 – no actions required to support designated beneficial uses	None
Middle Fork Clearwater River and Upper Selway River	Currently contain no listed stream segments	None

[1] Officially referred to as Assessment Units, which includes the full range of surface water categories such as rivers, creeks, lakes, reservoirs, ponds, etc.

The forest's priorities for completion of TMDL implementation plans are:

1. South Fork Clearwater River
2. Middle Salmon River and Chamberlain
3. Little Salmon River
4. Lower Salmon River

The 303(d)/305(b) integrated report is created by the state and is not a part of the land management plan; although the subwatershed conserve and restore priorities reflect state priorities. Changes in the forest's priority list are expected to occur routinely as areas of detrimental condition are restored and new projects identified.

State antidegradation policy requires that existing beneficial uses be maintained and protected on all water bodies.

The Forest Service shares the responsibility for completion of subbasin TMDL implementation plans with land managers and landowners within each of the above listed subbasins. The state of Idaho has the lead in TMDL development and approval. IDEQ 303(d)/305(b) integrated report may be updated every two years. These routine changes will not require revisions to the land management plan.

Forest Plan Monitoring Program Summary

Has progress been made toward accomplishing TMDL (total maximum daily load) implementation plan action items identified within the Nez Perce National Forest?

Table 4. Summary of monitoring strategy for TMDL action items

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
Number of actions	Implementation	Document progress toward TMDL implementation plan action items completed	High/High	Annual	25%

Drinking Water

The current strategy is to assure that the Nez Perce National Forest provide high quality public drinking water in compliance with applicable provisions of the Safe Water Drinking Act.

Direction for management of National Forest watersheds that supply municipal water is provided in 36 CFR 251.9 and Forest Service Manual 2542. Watershed lands are to be managed for multiple uses while recognizing domestic supply needs. Municipalities may apply to the Forest Service if they desire protective actions or restrictive measures not specified in the Forest Plan. Formal written agreements to assure protection of water supplies may be appropriate when multiple use management fails to meet the needs of a water user. No formal written agreements exist on either the Nez Perce National Forest for protection of municipal supplies.

The Idaho State Water Quality Standards (IDAPA 58.01.02.252.01.b.1) identify 4 small public water supplies in Clearwater and Idaho counties. Turbidity measured at the intake, is not to be increased more than 5 NTU above natural when turbidity is less than 50 NTU (IDAPA 58.01.02.252.01.b.2.(1), or more than 10% above natural background and not to exceed 25 NTU if background rates exceed 50 NTU (IDAPA58.01.02.252.01.b.2 (2).

All water that originates on the Forest could be used for municipal supply purposes at some point downstream, but management of USFS is significant for protection of municipal supply watersheds in only a few watersheds. The influence of forest management on municipal supplies depends on many factors, including the distance from National Forest lands to the intake, proportion of the contributing watershed that is National Forest and the land uses within that watershed.

Entities closer than 25 miles downstream from the Forest that derive all or a portion of their municipal supply water from watershed on the Clearwater or Nez Perce National Forest were considered in the analysis of existing condition. Most of these are more than 10 miles downstream of the Forest boundary. Management on USFS lands may have some influence on water quality, other land uses are assumed to have a greater influence. Management of USFS lands has the greatest potential to affect the quality of municipal supplies for Clearwater and Elk City, which are described in greater detail below.

Clearwater Water District

The town of Clearwater diverts water via a concrete dam in Wall Cr in the Nez Perce National Forest into a holding tank, with Special Use Permit for the intake. The water is treated with a direct pressure mixmedia filter and treated with chlorine and provided to 96 people. The Forest Service manages 100% of the watershed above the intake. The Source Water Assessment done by the Idaho Dept of Environmental Quality PWS#2250011 listed two potential contaminant sites, related to mine prospects.

Elk City Water District

The town of Elk City diverts water from Big Elk Cr downstream from the Forest boundary. About 100 connections are provided by the Elk City Water District. The Forest Service manages the majority of the watershed above the intake. The Source Water Assessment done by the Idaho Dept of Environmental Quality PWS#2250017 listed several potential contaminant sources, related to mine prospects and a CERCLA site.

The downstream communities of Kamiah, Orofino, Lewiston, Julietta, Konkolville, and Orofino Riverside also derive their domestic water supply directly from the surface water originating within the national forest. The city of Kamiah derives its drinking water from the Clearwater River and its drainage basin. The 4-hour or 25-mile time of travel zone for Kamiah includes the Middle Fork Clearwater River and its tributaries. The primary water quality issue currently facing the city of Kamiah is a potential contaminant spill into the Clearwater River or its tributaries and the problems associated with managing the contamination. According to Idaho State's drinking water database, in recent years, the Kamiah surface water intake has not encountered water quality problems. However,

because of the vulnerability of the shallow, poorly screened water intake, Kamiah's drinking water system is at high risk of contamination. The prospect of contamination caused by a potential contaminant spill into the Clearwater River or its tributaries is more pronounced due to the close proximity of Highway 12, a major route for commercial traffic including tanker trucks.

I In addition to community surface water supply, there are ground water drinking water sources for 7 campgrounds and ranger stations within the national forest boundaries. In addition to community surface and ground water supply, more than 133 individual groundwater wells, springs and streams in or near the Forest provide domestic water to families and ranches via wells, diversions, and spring sources. National Forest management has the potential to influence drinking water quality and quantity for many users.

The state of Idaho has completed a source water assessment for each of the 11 public water systems on the Nez Perce National Forest. These assessment reports include information on the potential contaminant threats to specific public drinking water sources, the likelihood that the water supply will become contaminated, and suggested management planning actions for communities and land owners. Once completed, community or use groups develop a written plan to document drinking water protection activities at the intakes and within the appropriate source areas.

Highest management priority is the protection of municipal and other potable water supplies to ensure that land management activities do not cause permanent deterioration in quality or quantity. Disturbance events such as wildland fires, landslides and flood flows may result in temporary exceeding of state water quality standards. Source water protections assure that no public water system should have to provide more drinking water treatment other than that which is necessary to address naturally occurring pollutant concentrations.

For additional information, see:

Incorporating Source Water Protection into the Planning and Projects
Idaho Wellhead Protection Plan
EPA Region 10 Source Water Protection Best Management Practices for USFS, BLM and State of Idaho Source Water Assessments for each public water source, available on Department of Environmental Quality website.

Forest Plan Monitoring Program Summary

What actions have been identified and completed to reduce the risk of potential drinking water contaminant sources?

Table 5. Summary of monitoring strategy for drinking water protection

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
Number of actions	Implementation	100% direct measure of implementation action to reduce contaminant risks.	High/High	Annual	25%

Instream Flow and Water Rights

The current strategy is to,

- Assure that Nez Perce National Forest, in cooperation with tribes, state and federal agencies and holders of valid water rights, leads to mutually beneficial programs for restoring, maintaining and utilizing water resources.
- Ensuring current state water rights records for Nez Perce National Forest purposes are up to date and the water is put to beneficial use as needed for those rights.
- Manage current consumptive and non-consumptive uses of water and water rights by the Nez Perce National Forest and others on the national forest NFS by utilizing the state's allocation process.

Both consumptive and non-consumptive water rights issues are currently being addressed with legal mechanisms. Water rights for National Forest purposes are claimed under state water law and federal reserve rights doctrine. Historic claims are being processed under the Snake River Basin Adjudication. These include consumptive and non-consumptive claims. Consumptive claims are mostly filed under state water law, with the exception of certain reserved claims for administrative purposes. Non-consumptive claims include reserved rights for Wild and Scenic Rivers. Non-reserved instream flow claims are being processed through the state comprehensive water planning process and the Nez Perce tribal settlement agreement under the Snake River Basin Adjudication. Instream flows for resource protection are also applied as conditions of special use permits.

Table 6. Number of Water Rights by Category and Ownership

Owner	Number of Water Rights and Claims			Totals
	Decreed	Statutory	License	
Federal Government	615	93	6	714
All Others	72	68	100	240

Federal water rights on National Forest System lands are processed by the Boise Adjudication Team, and performance is based upon their workload priorities. The adjudication team is not a permanent administrative structure, and the workload would likely revert to the forest within the planning horizon.

Forest Plan Monitoring Program Summary

What progress has been made toward meeting instream flow and water rights objectives? How many water rights have been decreed in the past 5 years? How many new claims have been filed in the past 5 years? What is the trend during the past 5 years?]

Table 7. Summary of monitoring strategy for instream flow and water rights

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
Number	Implementation	Number of decreed Forest Service water rights	High/High	Annual	25%
Number	Implementation	Number of special use permits and other authorizations conditioned	High/High	Annual	25%

Watershed Condition

The current strategy is to assure that Nez Perce National Forest management actions continue to provide water quantity and quality that support recreational uses, healthy riparian and aquatic habitats, the stability and effective functioning of stream channels and the ability to route flood flows.

Water yield and sediment transport are the primary focus in assuring the stability and effective function of stream channels. Forest management direction in the past 5 to 10 years has been to allow natural processes to dictate the variations in water yield and sediment transport in undeveloped areas. In the more developed forest areas, timber harvest, fire, mining, livestock grazing, recreation activities, road location and management have all played an interacting role with natural disturbances to either accentuate or lessen the intensity or duration of watershed processes.
In these road accessible areas, projects have been designed to incorporate a soil and water improvement component to minimize the potential for soil erosion and mass wasting to aid in restoring water flow patterns and to reestablish native plant species. The main efforts have been:

- Vegetation restoration to natural species, age and opening patterns.
- Soil decompaction of skid trail and log landings.
- Reducing the impacts of forest roads by road reconstruction, maintenance and decommissioning.

Forest roads were selected as a primary indicator of watershed condition because they have the longest lasting impact and are a common feature associated with most forest management activities. (See terrestrial vegetation, soil improvement, recreation, minerals management, travel management, noxious weeds and livestock grazing prospectuses for additional objectives that complement this watershed condition strategy.)
The Nez Perce National Forest road system was developed to access a variety of forest products and services such as timber, mineral development and access to private lands. For the past half century, timber harvest from the national forest provided the funding to build and maintain many of these roads. At one time, timber harvest program contributed from $1.5 to $2 million toward road maintenance. Once the harvest program began its decline in the last decade, the available road maintenance funds that were generated by timber purchasers also declined. Since Forest Service appropriated funding for road system maintenance is less than 20% needed to maintain the current road system, the backlog of maintenance needs continues to grow. The long-term effect of this backlog of maintenance on watershed condition is the deterioration of these roads and increased risk of increased surface runoff, road failure and resulting increase chronic sediment entering forest streams.

Currently, there are about 3,800 miles of forest development roads, or system roads on the Nez Perce National Forest (Table 7). It has been estimated that the Nez Perce National Forest contains from 1,000 to 1,500 miles of unneeded system roads and unclassified roads (about 200-300 miles). Forest road management emphasis in the past ten years has been to reduce the adverse effects of this transportation system by removal

of unneeded or reconstruction of permanent roads. Since 1996 over 250 miles of road have been decommissioned. About 2,800 miles are in intermittent service status (level 1 maintenance status).

Table 8. Summary of estimated road miles, road density and number of stream crossings by subbasin.

Subbasin Name	Road Density (mi/mi^2)	Road Mile Estimate	Subbasin Area (mi^2)	Total No. Stream Crossings
Upper Selway	0.03	10	377	10
Lower Selway	0.27	275	1,023	155
Middle Fork Clearwater River	2.71	290	107	100
South Fork Clearwater River	2.42	1,955	806	1,400
Lower Salmon River	2.95	1,015	344	600
Little Salmon River	1.15	70	61	55
Middle Salmon - Chamberlain	0.42	270	638	200

Watershed improvement projects (e.g., soil improvements or riparian planting) have been completed through appropriated funding combined with the Nez Perce Tribe and other external parties. The Nez Perce National Forest has completed an average 75 acres per year over the past five years. The total amount and location of the soil and water improvement opportunities within the Nez Perce National Forest has not been estimated.

Road system management is the Nez Perce National Forest's current emphasis in improving watershed function in managed areas. Soil improvements are expected to continue in conjunction with timber harvest projects (see soils strategy). Vegetation management focus is on restoring species composition, age structure, and natural opening patterns that promote near natural variations in water yield.

Highest priority road decommissioning and relocations are areas with high risk for culvert failure and creating stream debris torrent and roads on landslide-prone soils. Forest Service appropriated funds have been insufficient to maintain the entire road system that has accumulated over the past 100 years. Priorities for road maintenance have been directed toward arterial, collector, and a few selected local roads. Priorities for decommissioning are higher for local and unclassified roads in watersheds containing threatened fish species and where land types are at higher risk of slope failure. Program priorities may change in focus to reconstruction of permanent system roads as decommissioning objectives are achieved.

Past road decommissioning accomplishments are the result of substantial partnership funding, particularly with the Nez Perce Tribe. External partnership funding is not guaranteed.

There are an undetermined number of unclassified roads that are not recorded in the forest database. As the roads database is updated, road objectives may also be modified.

Forest Plan Monitoring Program Summary

What progress has been made toward improving watershed condition as indicated by road management objectives?

Table 9. Summary of monitoring strategy for road management to meet watershed condition objectives

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
Miles	Implementation	Roads decommissioned and treated for intermittent storage. 100% direct measure	High/High	Annual	50%
Miles	Implementation	Roads reconstructed. 100% direct measure.	High/High	Annual	50%
Miles	Compliance	Forest plan design criteria and state BMP compliance on reconstructed road segments. 100% direct measure.	High/High	Annual	25%

What progress has been made toward completing soil and water improvement projects?

Table 10. Summary of monitoring strategy for road management to meet watershed condition objectives

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
Acres	Implementation	Watershed improvement project reporting. 100% direct measure	High/High	Annual	25%

Special Water Features and Riparian Vegetation

The current strategy is to assure that Nez Perce National Forest maintains or improves:

- Flood plains and water tables to dissipate floods and sustain the natural timing and variability of water levels in riparian, wetland, meadow and aquatic habitats;
- Special habitats (springs, seeps, ponds, lakes and wetlands) so that their dependent species are sustained across the landscape;
- Vegetation in riparian conservation areas to assure they are composed of a diverse structure of native plant communities that perpetuate the distribution of woody debris, soil cover, bank stability and thermal characteristics of resilient aquatic and riparian ecosystems.

Disturbances that result in long-term loss of streamside vegetation can result in accelerated surface water flows and accelerate surface soil erosion. Compacted soil surfaces from streamside roads, trails, and facility developments can also slow or intercept subsurface water movement, effectively disconnecting the stream from its floodplain. A similar cause and effect relationship applies to springs, seeps and wetlands.

Campground facilities, mining activities, timber harvest, livestock grazing, trails and roads are common disturbances with roads having the largest influence within riparian areas (Table 11). Riparian conservation area protection measures were established in 1995 to reduce future impacts by these management activities.

System roads cover an estimated 2,400 acres (600 road miles) within riparian conservation areas on the Nez Perce National Forest. Many of these (38%;230 mi) are

arterial, collector, or locally important roads with limited opportunity for re-routing or removal. Over 20 miles of local and unclassified roads within riparian conservation areas have been permanently removed since 1996 for an estimated 80 acres of riparian conservation area improvements.

In the late 1800s to 1920s placer and dredge mining also removed riparian vegetation along an estimated 30 miles of stream in the upper section of the South Fork Clearwater River around Elk City. In Florence Basin and near Dixie in the Salmon River, riparian vegetation of an undetermined area has been impacted by mining activities. Stream habitat projects have improved over 20 miles and adjacent riparian vegetation since the mid-1980s. However, the magnitude of the stream and riparian habitats disturbance from mining provides additional opportunities for future improvements.

There are approximately 60 developed recreation and administration sites such as campgrounds, work stations and trailheads that have also contributed to the removal or change in quantity and quality of riparian vegetation. Past actions to correct these impacts include erosion control, plantings, closure of dispersed camps, and trail surface water bars. Hazard tree removal has been addressed on a site by site basis.

Past timber harvests within riparian conservation areas have converted about 30,000 acres into younger forest since the 1950's. Direct improvement actions have not occurred as the existing plant species represent the young age class of what might be expected naturally. In these cases the basic restoration strategy is allowing time for recovery. Invasive plant species in riparian habitats are common especially along roads and on disturbed soil surfaces. Active control strategies are appropriate.

Table 11. Riparian conservation areas potentially impacted by Forest Service management activities within the Nez Perce National Forest

Subbasin Name	Number, Acres or Miles by Activity Type in RCA			
	Roads (acres)	Mining (stream miles)	Facilities (No.)	Harvest (acres)
Upper Selway	8	0	2	0
Lower Selway	260	0	15	500
Middle Fork Clearwater River	68	0	0	400
South Fork Clearwater River	1,340	30	25	5,640
Lower Salmon	488		6	2,880
Little Salmon	28		1	140
Middle Salmon - Chamberlain	196		10	400

Riparian conservation areas containing federally threatened species, species of concern and interest are the highest priority for protection and improvement.

Past stream and riparian improvements are the result of substantial partnership funding, particularly with the Nez Perce Tribe. Appropriated Forest Service funding alone has been and is expected to continue to be insufficient to accomplish target objectives.

Forest Plan Monitoring Program Summary

Has progress been made toward conserving and restoring flood plains, water tables, wetlands and streamside vegetation species composition, structure, and patterns while conserving watershed processes?

Table 12. Summary of monitoring strategy for riparian conservation area (RCA) improvement actions

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
Acres	Implementation	100% direct measure roads and trails decommissioned, relocated, and maintained in RCAs	High/High	Annual	25%
Acres	Compliance	RCA improvements and protection measures applied to facilities management and improvements	High/High	Annual	25%
Acres	Compliance	RCA improvements and protection measures applied to vegetation management projects	High/High	Annual	25%

Aquatic Habitats

The current strategy is to assure that the Nez Perce National Forest maintain or improve aquatic habitats and water quality.

Condition of stream habitats within the Nez Perce National Forest could be characterized as good to excellent in the conserve designated subwatersheds. Within the restore designated subwatersheds the streams downstream of the roads and managed forest landscapes generally exhibit habitat features that are less than desired. These stream segments have been the focus of stream improvement projects and monitoring.

Because of the direct stream habitat improvement projects and the implementation of PACFISH and INFISH direction in 1995, the general aquatic management strategy has been to improve the conditions in degraded stream segments. Since 2000, 82 stream miles and 80 lake acres have been improved. Examples of these improvement activities include stream reconstruction, providing fish passage at road stream crossings and riparian area fencing.

Program priorities are:

1. Continue protection of intact and functioning stream reaches and improve those that do not meet or are trending away from desired stream features. Natural disturbance processes are the primary factor shaping aquatic habitats in identified conserve subwatersheds.
2. Cooperation with Idaho Fish and Game department invasive fish species control projects in high mountain lakes to reduce risks to native fishes.

Substantial partnership involvement provides support for stream and lake habitat improvement program, especially those contributions from the Nez Perce Tribe and Idaho Department of Fish and Game.

Forest Plan Monitoring Program Summary

What progress has been made to improve stream and lake habitat conditions?

Table 13. Summary of monitoring strategy for aquatic habitat improvements

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
miles	Implementation	100% direct measure of stream habitat improvements.	High/High	Annual	25%
acres	Implementation	100% direct measure of lake habitat improvements.	High/High	Annual	25%

Fish Passage

The current strategy is to assure that Nez Perce National Forest aquatic habitats support well-distributed populations of native and desired nonnative animal species.

Aquatic animals unrestricted stream access to suitable habitat is the primary element defining well-distributed populations necessary to foster life history diversity and unique genetic populations. Native fish species currently have unrestricted access to 80% of suitable stream habitat (2,200 miles). However, an estimated 380 stream crossings impede fish migration or movement affecting 285 stream miles. The Nez Perce National Forest has improved fish access to 20 miles of suitable stream habitat by replacement of 10 large crossing structures and removal of about 20 smaller road crossing structures since 2000. It is estimated that at least 35 additional fish barriers (road culverts) have been removed during road decommissioning. Many of these removals and replacements also reduce the risk of road failure due to under-sized or aging road culverts and subsequent downstream impacts to aquatic habitats.

Table 14. Aquatic habitat access existing condition and improvement efforts over the past 5 years.

Subbasin Name	# Existing Fish Barriers	# Replaced or Removed	Stream Miles Access Improved
Upper Selway	3		
Lower Selway	16		
Middle Fork Clearwater River	6		
South Fork Clearwater River	215		
Lower Salmon	68		
Little Salmon	2		
Middle Salmon - Chamberlain	67		
Total:	377		

Federal law requires that the design, construction and maintenance of road crossings shall not disrupt the migration or other movement of aquatic life inhabiting the water body. Stream crossings restricting passage of threatened and endangered species, species of concern and interest are highest priority for removal or replacement.

Partnership funding for stream crossing replacements is determined year to year and not guaranteed. Current sources of funding include Forest Service, Nez Perce Tribe, Bonneville Power Association and Pacific Coast. Opportunities for measurable increase in habitat decreases as high priority crossing removal and replacements are completed.

Forest Plan Monitoring Program Summary
What progress has been made with improving stream access for aquatic animals' movement and migration?

Table 15. Summary of monitoring strategy for improved stream access

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation
Miles	Implementation	100% direct measure	High/High	Annual	25%
Number of Crossings	Implementation	100% direct measure	High/High	Annual	25%

Partnerships

The current strategy is to address the Nez Perce National Forest fisheries and watershed program coordination with federal, tribal, state and county management actions. Types of coordinated program elements include the threats of invasive aquatic species on native aquatic animal populations, annual monitoring actions, ongoing research projects on the national forest, fish habitat and watershed improvement projects.

Biannual meetings with Tribe, federal, and state agencies have occurred to facilitate data transfer, coordinate project planning, project implementation, and monitoring. This coordination is designed to facilitate efficient data collection, and share human and financial resources in accomplishment of mutual program goals. In addition to annual meetings, individual project coordination with interagency and tribal partners has facilitated project implementation. An example of these projects includes habitat improvements such as fish migration barrier removals, road decommissioning, riparian planting and invasive species eradication. Another part of the program of work includes interagency planning and monitoring reviews such as TMDL implementation plan development, and compliance monitoring.

Although not directly responsible for fisheries population management, the Nez Perce National Forest considers their contribution toward recovery of native species a high priority by providing quality aquatic habitats. Highest priority watershed improvements are coordinated with state of Idaho TMDL implementation planned actions.

Forest Service participates with the Tribe, federal and state agencies through the contribution of resources (partial funding, materials and labor). Internal and external funding sources are not guaranteed.

Forest Plan Monitoring Program Summary
Has the current high level of program coordination and partnership project implementation been maintained?

Table 16. Summary of the monitoring strategy for cooperative watershed and aquatic species management actions.

Measure	Monitoring Category	Monitoring Technique	Precision and Reliability	Frequency	5-Year Deviation

Number	Compliance	Number of field reviews of ongoing or completed projects in compliance with USFS directives and BMPs.	High/High	As identified	10%
Number	Compliance	Count of projects and consultations completed	High/High	Annual	5%
Number	Implementation	Number of watershed and aquatic partnership improvement projects completed.	High/High	Annual	5%