Umatilla National Forest

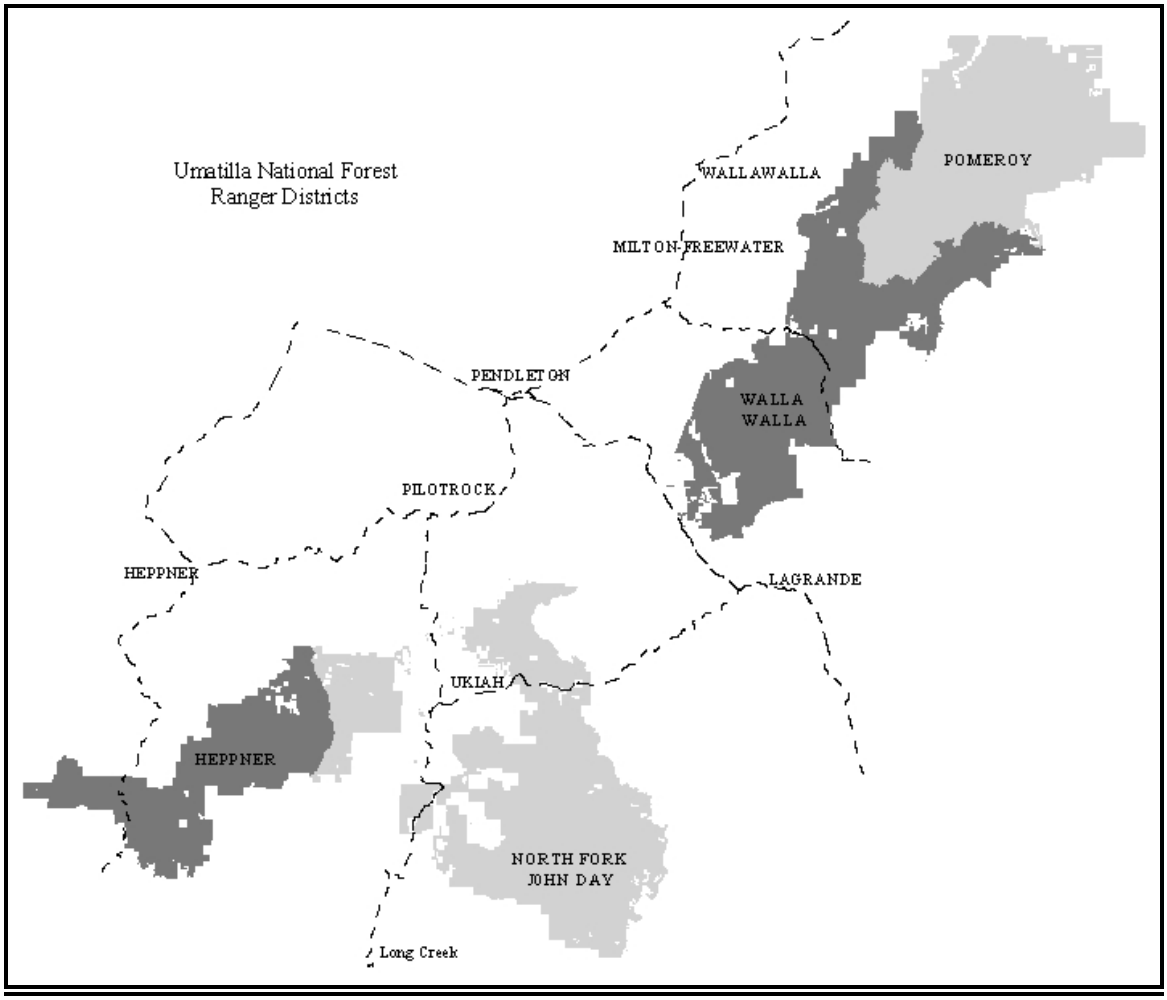
FOREST SUPERVISOR OFFICE
2517 SW Hailey Avenue
Pendleton, Oregon 97801
(541) 278-3716
Jeff D. Blackwood, Forest Supervisor

HEPPNER RANGER DISTRICT
P.O. Box 7
Heppner, Oregon 97836
(541) 676-9187
Andrei Rykoff, District Ranger

NORTH FORK JOHN DAY RANGER DISTRICT
P.O. Box 158
Ukiah, Oregon 97880
(541) 427-3231
Craig Smith-Dixon, District Ranger

POMEROY RANGER DISTRICT
71 West Main
Pomeroy, Washington 99347
(509) 843-1891
Monte Fujishin, District Ranger

WALLA WALLA RANGER DISTRICT
1415 West Rose Street
Walla Walla, Washington 99362
(509) 522-6290
Mary Gibson, District Ranger


Umatilla National Forest
Ranger Districts
WALLAWALLA
POMEROY
MILTON-FREEWATER
PENDLETON
WALLA
WALLA
PILOTROCK
HEPPNER
LAGRANDE
UKIAH
HEPPNER
NORTH FORK
JOHN DAY
Long Creek

SECTION U

Table of Contents

LIST OF TABLES AND FIGURES

MONITORING ITEMS NOT REPORTED FOR FY2001

A number of Monitoring Items from the Umatilla Forest's 1994 Monitoring Strategy were not reported in FY2001. Some items need only to be reported at predetermined intervals to detect trends; some were purposely deferred pending updated monitoring protocols or direction; while others were deferred due to lack of funding, personnel issues, or other work priorities.

Monitoring Items that were not reported are as follows:

Item 7	Stream Channel Morphological Features
Item 8	Fire Effects - Wildfire on Water and Soils
Item 9	Riparian Vegetation
Item 10	Level of Utilization
Item 11	Range Condition and Trend
Item 16	Stand Management - Ponderosa Pine Regeneration
Item 20	Threatened, Endangered, and Sensitive Plants
Item 26	Pileated and Northern Three-Toed Woodpecker Populations
Item 27	Pine Marten
Item 29	Plant and Animal Diversity
Item 30	Management Areas/Standards and Guidelines
Item 31	Primitive/Semi-Primitive Recreation and Roadless Areas
Item 32	Off-Highway Vehicle (OHV) Use
Item 35	Existing Visual Conditions
Item 37	Limit of Acceptable Change and Amount of Primitive Wilderness
Item 38	Allotment Planning
Item 39	Range Outputs
Item 40	Range Improvement
Item 42	Timber Yield Projections
Item 46	Forest Road System
Item 47	Open Road Density
Item 48	Trails
Item 50	Cultural Properties/Sites
Item 51	Effects of Forest Management Activities on Special Interest Areas
Item 52	Research Natural Areas
Item 53	National Environmental Policy Act/National Forest Management Act
Item 54	Changes in Income Levels, Populations, and Employment
Item 55	Payments to Counties
Item 56	Lifestyles, Attitudes, Beliefs, Values, and Social Organizations
Item 57	Forest Contributions to the Local Timber Supply
Item 58	Forest Budget
Item 59	Costs/Values of Forest Plan

FOREST PLAN AMENDMENTS FOR FY2001

No nonsignificant Forest Plan amendments were prepared in fiscal year 2001.

SUMMARY OF FINDINGS AND RECOMMENDED ACTIONS

The Summary of Recommended Actions, beginning on page U-6, shows all Umatilla Monitoring Items and whether they were deferred, consolidated with the other Blue Mountain Forests (Section C), or reported in this section (U). The table summarizes the key findings and the recommended actions to be taken as a result of this year's monitoring for the Umatilla National Forest. A more complete analysis of this years reported monitoring items can be found later in this section (U) or in the Coordinated Monitoring Section (C).

Categories of recommended actions are identified in the table as follows:

Change Practices (CP) - Indicates that the results of current practices are outside the thresholds of variability and/or are not meeting specific direction set by the Forest Plan. A change in practice or procedure may be needed.

Further Evaluation (FE) - Indicates that results may or may not have exceeded the threshold of variability, but additional information or evaluation is needed to better identify the cause of the concern and/or determine future actions.

Amend Forest Plan (AP) - Indicates that results are inconsistent with the Forest Plan, or the Forest Plan direction was not clear. The Forest Plan may need to be changed or clarified through the amendment or revision process.

Continue Monitoring (CM) - Indicates we will continue with the current protocol.

Not Evaluated (NE) – The monitoring item was not evaluated this year.

Summary of Recommended Action

♦ 2001 Monitoring Report ♦

Umatilla National Forest

Report Section*	MI #	Monitoring Item (MI)	2000 Action	2001 Recommended Action			Remarks**
				Change Practice	Further Eval.	Amend Forest Plan	
I. PHYSICAL RESOURCES							
COORD	1	Air Quality	CM				"Air Quality and Smoke Management". State reporting requirements were met. There were no smoke intrusions. Continue to monitor.
COORD	2	Soil Productivity	CM				Activities are meeting Forest Plan standards and guidelines. BMPs working properly. Monitoring measurement methods need updating. Continue to monitor.
UMA	3	Water Quantity	NE				No significant difference in annual water yields reported from study on the Umatilla. Continue to monitor.
UMA	4	Water Quality	FE				Generally water quality is good to excellent. Temperature is most widespread impairment. Continue to monitor.
UMA	5	Stream Temperature	CP FE		X		Most streams not meeting state water quality standards for temperature.
UMA	6	Stream Sedimentation	NE				Monitoring results show high variability of suspended sediment. Continue to monitor.
DEF	7	Stream Channel Morphological Features	NE				Not evaluated in FY2001.
DEF	8	Fire Effects - Wildfire on Water and Soils	NE				Not evaluated in FY2001.
II. BIOLOGIC RESOURCES							
DEF	9	Riparian Vegetation	NE				Not evaluated in FY2001.
DEF	10	Level of Utilization	FE				"Forage Utilization". Not evaluated in FY2001.
DEF	11	Range Condition and Trend	NE				Not evaluated in FY2001.
COORD	12	Noxious Weeds: Invasive Vegetation	CM				"Vegetation Management and Noxious Weeds". 9,981 gross acres treated. 1,565 acres of new sites in FY2001. Over half of watersheds have high risk of invasion and spread. Continue to monitor.
COORD	13	Silvicultural Harvest Method	FE AP		X	X	"Harvest Method and Acres". Harvest at 35% of level planned in Forest Plan. Primarily shelterwood and unevenage methods. No clearcut acres.

* More information on items can be found in: UMA = Umatilla; COORD = Coordinated; ACCOM RPT = Accomplishment Report Table at the end of the Umatilla section. DEF = Deferred (not evaluated FY2000

** Items in quotation marks note title of items in the Coordinated Section if different from the Forest monitoring title.

Report Section*	MI #	Monitoring Item (MI)	2000 Action	2001 Recommended Action			Remarks**
				Change Practice	Further Eval.	Amend Forest Plan	
COORD	14	Created Openings	CM				"Harvest Method and Acres". No activities proposed that would exceed standards. Continue to monitor.
COORD	15	Stand Management - Regeneration	CM				"Reforestation". 1,369 acres were planted, and 4,425 acres were naturally regenerated. NFMA reforestation standards generally met. Continue to monitor.
DEF	16	Stand Management - Ponderosa Pine Regeneration	NE				Not evaluated in FY2001.
COORD/ ACCOM RPT	17	Stand Management – Noncommercial Thinning.	CP AP	X		X	2,514 acres treated. Backlog accumulating. Forest Plan projections underestimated need.
COORD	18	Fire Effects - Prescribed Fire	CP AP	X		X	"Fire Managed for Resource Benefits". 16 natural ignitions within wilderness, all suppressed.
COORD	19	Vegetation Management	CM				"Vegetation Management and Noxious Weeds". 2,466 acres treated (1,719 acres reforestation site prep, 232 acres stand release, and 515 acres wildlife habitat improvement). Continue to monitor.
DEF	20	Threatened, Endangered, and Sensitive Plants	NE				Not evaluated in FY2001.
COORD	21	Insect and Disease Control	CM				"Insects and Diseases". Significant tussock moth defoliation on Heppner RD, but overall infested acres down from FY2000. Monitor for bark beetles. Continue to monitor.
UMA	22	Anadromous and Resident Fisheries	CM		X		Snake River and Mid-Columbia steelhead trout show declining population trends.
COORD	23	Elk/Deer Habitat and Estimated Populations	CP AP	X		X	"Elk/Deer Habitat". HEI no longer a useful tool to evaluate elk habitat.
COORD	24	Old Growth Tree Habitat	FE		X	X	"Old Growth Habitat". Ecosystem analyses show declines in old forest from historic levels, both from management activities and natural disturbances.
COORD	25	Dead and/or Defective Tree Habitat	CM				Monitored projects met or exceeded snag and down wood standards. Continue to monitor.
DEF	26	Pileated and Northern Three-Toed Woodpecker Populations	NE				Not evaluated in FY2001.

Report Section*	MI#	Monitoring Item (MI)	2000 Action	2001 Recommended Action			Remarks**
				Change Practice	Further Eval.	Amend Forest Plan	
DEF	27	Pine Marten	NE				Not evaluated in FY2001.
UMA	28	Threatened/Endangered/Sensitive Wildlife Species	CM				No eaglets fledged. Negative results for lynx. Continue to monitor.
DEF	29	Plant and Animal Diversity	NE				Not evaluated in FY2001.
III. RESOURCES AND SERVICES TO PEOPLE							
DEF	30	**A. Forest Plan Implementation** Management Areas/Standards and Guidelines	NE				Not evaluated in FY2001.
DEF	31	**B. Recreation** Primitive/Semi-Primitive Recreation and Roadless Areas	NE				Not evaluated in FY2001.
DEF	32	Off-Highway Vehicle (OHV) Use	CM				Not evaluated in FY2001.
COORD/ ACCOM RPT	33	Developed Sites	AP				Developed sites on the Walla Walla RD are generally meeting demand, with the exception of Jubilee Lake on weekends. Continue to monitor.
COORD	34	Wild and Scenic Rivers	NE				Free flowing characteristics of eligible and designated rivers were protected. Continue to monitor.
DEF	35	Existing Visual Condition	NE				Not evaluated in FY2001.
UMA	36	Nonconforming Uses	NE				Level of nonconforming use is low enough such that wilderness values are not damaged. Continue to monitor.
DEF	37	Limit of Acceptable Change (LAC) and Amount of Primitive Wilderness Resource Spectrum (WRS)	NE				Not evaluated in FY2001.
DEF	38	Allotment Planning	FE				“Allotment Management Planning”. Not evaluated in FY2001.
DEF	39	Range Outputs	CM				Not evaluated in FY2001.
DEF	40	Range Improvement	CM				Not evaluated in FY2001.
DEF	41	Identification of Lands Suitable for Timber Management	NE				“Timber Suitability”.
DEF	42	Timber - Yield Projection	NE				Not evaluated in FY2001.

				2001 Recommended Action			
Report Section*	**MI #**	**Monitoring Item (MI)**	**2000 Action**	**Change Practice**	**Further Eval.**	**Report Section***	**MI#**
COORD	43	Timber Offered for Sale	FE AP		X	X	Total Program Sale Quantity was at 11% of Forest Plan level.
UMA	44	Availability of Firewood	CM				Current demands are being met. 2,739 permits sold. Continue to monitor.
COORD	45	Mineral Development and Rehabilitation (MDR) Accessibility	FE				"Minerals". Standards and guidelines are being met.
DEF	46	Forest Road System	CM				"Roads". Not evaluated for FY2001.
DEF	47	Open Road Density	CM				"Roads". Not evaluated for FY2001.
DEF	48	Trails	NE				Not evaluated for FY2001.
COORD	49	Fire - Program Effectiveness	CM				"Wildland Fires". Number of fires below average. Continue to monitor.
DEF	50	Cultural Properties/Sites	CM				"Cultural and Historic Site Protection". Not evaluated for FY2001.
DEF	51	Effects of Forest Management Activities on Special Interest Areas	NE				Not evaluated for FY2001.
DEF	52	Research Natural Areas (RNAs)	NE				Not evaluated for FY2001.
DEF	53	National Environmental Policy Act (NEPA)/National Forest Management Act (NFMA)	CM				Not evaluated for FY2001.
IV. SOCIAL AND ECONOMIC * **							
DEF	54	Changes in Income Levels, Populations, and Employment	CM				"Socio-Economics". Not evaluated for FY2001.
DEF	55	Payments to Counties	CM				"Socio-Economics". Not evaluated for FY2001.
DEF	56	Lifestyles, Attitudes, Beliefs, Values, and Social Organizations	NE				"Socio-Economics". Not evaluated for FY2001.
DEF	57	Forest Contributions to the Local Timber Supply	NE				"Socio-Economics". Not evaluated for FY2001.
DEF	58	Forest Budget	NE				"Socio-Economics". Not evaluated for FY2001.
DEF	59	Costs/Values of Forest Plan	NE				"Socio-Economics". Not evaluated for FY2001.

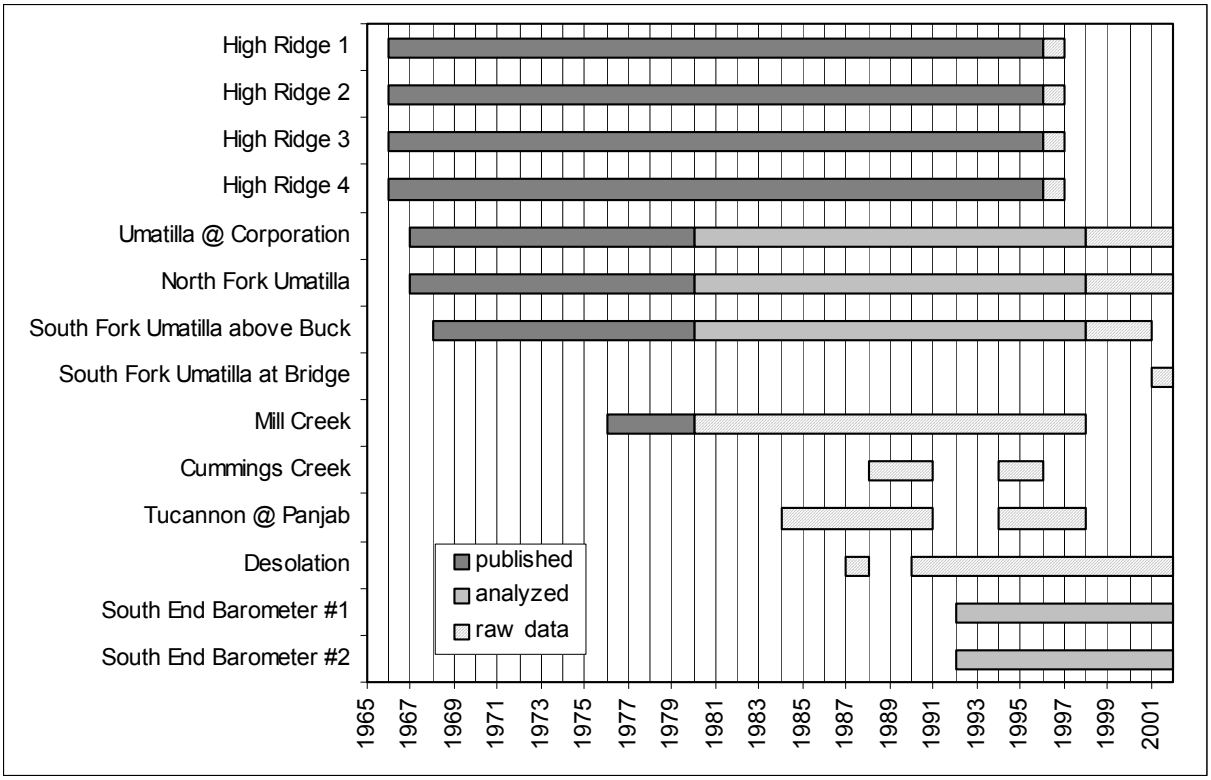
***A new monitoring process delayed report generation for the budget items.

Water Quantity
Item 3

Questions: What is the water yield from the Forest and key watersheds? Are management activities significantly affecting the volume of water yield from Forest watersheds? Are management activities significantly affecting the timing of water yield from Forest watersheds? Are management activities significantly affecting summer low flows from Forest watersheds?

Water yield continues to be an issue in Forest management. Measurements of stream discharge began in the mid 1960's as part of the Umatilla Barometer watershed study (Figure U-1). Gauging stations were later established on Mill Creek, Desolation Creek, and the Tucannon River. Results from the High Ridge Evaluation Area (part of the Umatilla Barometer study) were summarized in the 1998 Monitoring and Evaluation Report, and are available in a report by J. David Helvey and William B. Fowler (1996) *"Effects of timber harvest on the hydrology and climate of four small watersheds"*. Ten years of baseline data (discharge, water temperature, sediment, pH, bacteria, dissolved oxygen) have been collected at the South-end watershed study on Heppner Ranger District (Figure U-1). Eighteen years of streamflow data for three stations on the upper Umatilla River are summarized in Figure U-2.

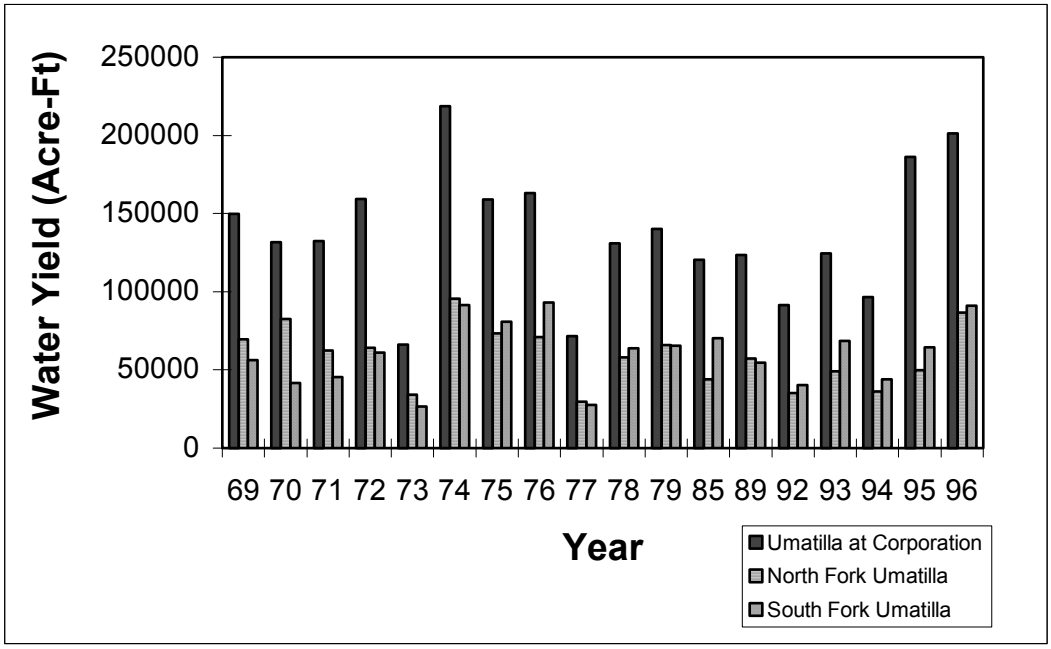
Figure U-1
SUMMARY OF DISCHARGE RECORDS



Overall, detection of management-related changes in water yield and low flow beyond the small catchment (100's of acres) scale is difficult at best because of annual variability in precipitation and the complexity of watershed processes governing streamflow. Small changes in flow that may occur due to changes in the extent of forest cover, for example, are difficult to measure and generally overwhelmed by variability in precipitation and snowpack conditions. Statistical analysis of water yields at the Umatilla gages (Corporation, North Fork and South Fork) comparing 1969 –1979 to 1985 –1996, showed no significant difference in annual water yields. Extensive changes in forest cover have potential to affect water yields, for example, extensive

wildfires (1996 fires on the NFJD and Heppner Districts) and insect outbreaks (Tussock moth outbreak of 1999-2001), however, continuous discharge measurement in the affected areas is lacking.

Figure U-2
WATER YIELD ON UPPER UMATILLA RIVER STATIONS



The Umatilla Barometer watershed study yielded important findings about timber harvest effects on streamflow at the catchment scale. Results from this study have been used in planning projects involving timber management, however, management emphasis in the last 10 years has shifted to uneven-age management, thinning, and prescribed fire treatments with riparian buffers, treatment types that were not in the original plan. There will continue to be a need for basic data on water yields, peak flows, and low flows to address issues of water supply and water quality on the Forest and downstream.

The South-end watershed study was designed to evaluate the effects of prescribed fire and fuels treatments on hydrology, water quality, and aquatic ecosystems. Ten years of baseline data have been summarized, and the project is ongoing with treatments scheduled in the next several years.

Evaluation and Recommended Action:

- Analyze and report the backlog of discharge data from the Umatilla River and Desolation gages.
- Evaluate data from the Tucannon River and make a determination whether to activate or discontinue this station.
- Develop stable funding source to maintain core set of baseline gauging stations (NF and SF Umatilla River Desolation Creek).
- Maintain South-end watershed study for a minimum of 5 years following treatments.

Water Quality
Item 4

Questions: Are Forest management activities or other factors affecting water quality parameters in Forest streams? Has the Forest met its designated obligations and responsibility with respect to management of non-point source pollution? Did the Forest comply with the Clean Water Act as outlined in memorandum of understandings (MOUs) with the States of Oregon and Washington? What is the long-term trend in water quality? Are Best Management Practices and other measures implemented as designed to protect water quality? Are Best Management Practices and other practices effective in meeting water quality goals?

The Forest water quality-monitoring program includes measurement of instream water quality parameters, evaluation of management practices, and interagency coordination. The water quality parameters of greatest concern, water temperature and sediment, are addressed in separate monitoring items (MI-5 and MI-6).

Stream water quality was evaluated using automated instream pumping samplers at the following locations: Tucannon River (at Panjab Creek and the Forest boundary), Pataha Creek, Umatilla River (North Fork, South Fork and Corporation), Desolation Creek, and Skookum Creek (two sites). Daily (composite) samples were analyzed for suspended sediment (mg/l), turbidity (NTU), total dissolved solids (mg/l), and conductivity (mmhos). Data summaries have been completed for the Tucannon and Umatilla stations (see sediment results in MI-6).

Grab sampling was conducted at 14 locations (nine streams and one lake) on the Heppner District. Samples are collected four times a year (in November, February, May, and August) and analyzed for dissolved oxygen (mg/l), coliform bacteria (total, fecal, and *E. coli*), suspended solids, total dissolved solids, conductivity, nitrates, and pH.

All data are stored in the Environmental Protection Agency's modernized STORET program, available at: www.epa.gov/storet.

BMP Monitoring

Three timber sales on the Walla Walla and Pomeroy Districts (Lick, Abla, Cliffhanger) were selected for systematic sampling of BMP practices. Projects were selected from the pool of all timber sales implemented in the last 5 years using the following criteria: projects with a full range of practices (roadside salvage projects were eliminated) representing a range of ecotypes. Older projects designed before PACFISH were dropped because these projects are not representative of current practices. All harvest units with stream segments within or adjacent to the unit were identified using sale area maps. From this pool of candidate units, 22 units were randomly selected. All stream segments associated with each selected unit were included in the evaluation. Randomly selected skid trails (harvester-forwarder and conventional) were evaluated in 15 harvest units. A total of 25 stream segments and 49 forwarder routes and skid trails were evaluated. Practices evaluated included: width of RHCA (implementation), and visual evidence of sediment transport from unit to buffer (effectiveness); and, skid trail spacing, percent bare ground, and presence/effectiveness of waterbars and slash (Table U-1).

Table U-1
SELECTED TIMBER HARVEST BMPS

Practice	Measures and Standards		
Riparian Habitat Conservation Areas	width	intermittent 100'	perennial 150'
Skid Trails: Harvester Forwarder: Tractor Skidder Trails:	Spacing 40' 100'	% bare ground on trail	waterbars or slash

Road obliteration projects implemented in the last 4 years were evaluated to determine implementation and effectiveness of restoration practices, including BMPs designed to reduce short-term effects. Units were randomly selected, with a total of 19.5 miles of road (11.3 miles on Walla Walla and 8.2 miles on Pomeroy District) included in the sample. Road segment lengths varied from 0.15 to 1.15 miles. Projects were categorized by general slope position to separate hydrologic effects of treatment (Table U-2).

Table U-2
SUMMARY OF SAMPLED ROAD RESTORATION MILES BY SLOPE POSITION

Slope Position	Miles	%
Plateau	5.15	26
Hillslope	10.35	53
Valley bottom	4	21
Total	19.5	100

Four categories of practices were identified for evaluation: road access, treatment of road surfaces, treatment of cut and fill slopes, and stream crossings, with measures or treatment types under each category (Table U-3). Road restoration practices were evaluated using four categories of implementation and effectiveness: not present-not needed (NP-NN), not present-needed (NP-N), in place-working (IP-W), or, in place-not working (IP-NW). Criteria for evaluation included evidence such as: unauthorized access around barriers (wheel tracks), slope stability (slumping, erosion), mulching or vegetative cover, ripping, evidence of seed survival, waterbars, and crossing stability.

Table U-3
ROAD RESTORATION PRACTICES AND TREATMENT TYPES

Access/use of road	Cut and fill slopes		Road surface				Streamcourse Crossings	
Physical Barriers	Reshaping	Mulching, etc.	Structure Removal	Ripping, etc.	Seed Reveg.	Water bars	Structure Removal	Water bars

BMP Monitoring Results

The stream category (class) identified at the time of design and layout determines the width of RHCA buffers. Stream category is established during project planning using a combination of GIS-mapped stream classes and field verification. Most of the projects in the evaluation were in headwaters areas where the boundary between intermittent (required buffer) and ephemeral (no required buffer) is indistinct and variable year to year. In general, streams are mapped on sale area maps primarily using the existing stream layer, and identified contractually as “protect water course” without reference to stream category and therefore to RHCA width. Documentation of stream category during design and layout is essential to ensure reliable post-project BMP monitoring.

Stream buffers are being designed and implemented on many small, ephemeral headwater streams. Protecting headwater stream sources will help buffer downstream areas. Buffers met standards on the majority of intermittent and perennial streams in the sample, however, the small sample size and confusion over stream category limited conclusive findings. As timber sale harvest units are increasingly designed to exclude most streams a reasonable sample size for this practice may be difficult to obtain in future monitoring.

Monitoring effectiveness of riparian buffers continues to pose challenges. For intermittent and ephemeral streams, there was no physical evidence of sediment transport or erosion within any of the RHCAs evaluated. There was a limited sample of perennial RHCAs, and no quantitative evaluation of buffer effectiveness.

Overall, the area of exposed soil on skid trails was very low, and structural measures (waterbars) were generally not needed. The low level of exposed soil is due in part to the use of harvester-forwarder systems,

which tend to disturb less soil compared to conventional tractor logging. On the Lick sale (Pomeroy District), slash was hauled back onto the units so the grapple skidders were operating on a slash "mat". Slash was common on skid trails and effective in reducing runoff and erosion, a result of the prescriptions and logging systems.

Road restoration practices were generally implemented and effective. The greatest need for improvement in BMPs appears to be in revegetating restored sites. More input from resource personnel with experience in appropriate seed types and effective application for improved site revegetation may be helpful in future projects. The decision to seed restored sites is based on potential for natural revegetation, and the timing of seeding often occurs some time after mechanical treatments when soil moisture conditions are appropriate. Roads selected for future monitoring should be at least one year old to allow vegetation to develop.

Compliance with Clean Water Act

The Forest has been actively engaged in implementing the strategy described in the "Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters" (May 1999). Activities include: (1) providing data, review, and comments to the State's 303(d) listing process (Oregon and Washington), (2) active involvement in developing TMDLs and Water Quality Management/Restoration Plans in the upper Grande Ronde, Umatilla, and Walla Walla subbasins, and, (3) active involvement in revising and implementing MOAs with States.

Evaluation:

Water quality continues to be an important issue on the Umatilla National Forest. In general, water quality is good to excellent with exceptions related to natural background conditions and management-related impacts. Water temperature is the most widespread water quality impairment (addressed in MI-5). Sediment is locally of concern in key streams supporting salmonids (addressed in MI-6). Bacteria may be of concern in localized areas associated with heavy recreation use and grazing (both domestic and wild ungulates). Heavy metals have been a concern in the Clear Creek and Granite watersheds. Past programs to concentrate and settle mine outflow in settling ponds need to be evaluated to determine effectiveness. Restoration of abandoned mines and management of active mining claims continue to pose challenges for the Forest.

BMP monitoring programs have improved in recent years, with more systematic sampling of practices, and evaluation of restoration activities.

Water quality data collected since 1999 have been entered into modernized STORET. Data collected prior to 1999 have been checked for accuracy and are stored in legacy STORET.

Recommended Actions:

- Summarize water quality data from key Forest stations such as the Desolation gage. Strategically analyze and report findings through Watershed Analysis and project-level planning.
- Evaluate bacteria sampling objectives and adjust sampling program to improve understanding of bacteria presence and persistence in Forest streams.
- Continue systematic BMP monitoring of forest practices including, but not limited to, timber, fire, range, recreation, watershed restoration, and minerals, with emphasis on the South Zone in 2002.
- Continue adjustments to overall sampling program, such as discontinuing Umatilla at Corporation sediment sampling, to reduce redundancy, improve sampling efficiency, and improve responsiveness to management issues.
- Support and build on cooperative monitoring programs currently in place, such as the Umatilla Subbasin TMDL monitoring program, and develop new partnerships as opportunities arise.
- Link water quality data with Geographic Information Systems (GIS) and use web-based information systems to communicate Forest water quality issues and status.
- Develop stable funding for water quality monitoring through leveraging appropriated funds with grants and partnerships.

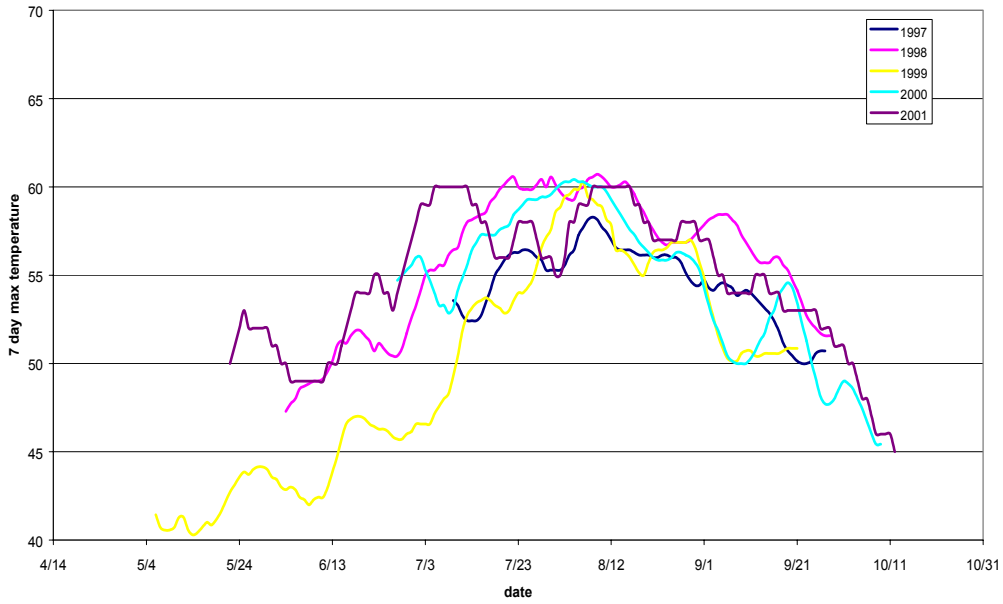
Stream Temperature
Item 5

Questions: Is project implementation in riparian areas resulting in attainment of desired future conditions for stream surface shading and/or in-stream water temperatures? What are the long-term changes and trends in stream temperatures? Are the long-term changes meeting Forest Plan objectives? What are the cumulative effects of Forest management activities on stream temperatures?

Water temperatures were measured at 144 locations across the Forest with recording thermographs, devices used for continuous measurement of temperature. Instruments are generally set to record on an hourly basis. Summer water temperatures reach maximum in mid to late July in response to the combined effects of snowmelt recession and increase in air temperature.

A summary of the maximum 7-day average of the daily maximum temperatures for selected streams across the Forest for the past 5 years shows year-to-year variability resulting from seasonal differences in climatic conditions, water supplies, and overall watershed condition. For example, over a 5-year period (1997-2001), temperatures on Panjab Creek, a tributary to the Tucannon River, were highest in 1998 and lowest in 1997, largely driven by differences in snowpack (Figure U-3). Differences in annual maximum water temperatures are most evident where large-scale changes in watershed conditions have occurred such as watersheds that have had extensive wildfire (Table U-4). Trends are difficult to detect using the single 7-day average of the daily maximum temperature value. Analysis of data from above-and-below or before-and-after activities is more likely to show trends. State temperature standards were not met at many of the monitoring stations. In addition to the 7-day maximum of daily maximum temperatures, duration analysis, or the percentage of time temperatures are exceeded, may be a useful way to display data. In the case of Panjab Creek, temperatures were monitored during the summer months and exceeded 60 degrees Fahrenheit 16 percent of the time (Figure U-4).

Figure U-3
PANJAB CREEK (MOUTH) TEMPERATURE DATA 1997-2001



A useful technique for measuring surface water temperatures over large areas, increasingly in use, is aerial mapping using infrared radar, or “FLIR” (Forward-Looking Infrared Radar). Many streams in northeastern Oregon have been mapped using the FLIR technology. Results have been used to plot temperature profiles

along river reaches, identify cold-water refuge areas, and add spatial information to thermograph (temporal) monitoring. In FY2001, Desolation Creek from the mouth to headwaters was mapped using FLIR (Figure U-5). The temperature profile shows a warming trend from headwaters to mouth, as would be expected, however, three cooling reaches are apparent where tributaries appear to be influencing the main stream temperatures.

Table U-4
ANNUAL SUMMER MAXIMUM WATER TEMPERATURES
(7-Day moving average of the daily maximum, ºF)

Stream Name	Basin	1997	1998	1999	2000	2001	Temp Standard	# days above Standard in 2001
Henry Cr @FB	John Day	71	75	72	69	70	64	64
Herren Cr	Willow	62	64	ND	63	62	64	0
Wall Cr @FB	NF John Day	68	77	76	74	75	64	40
Hidaway Cr[1]		77	78	75	77	71*	64	60
Oriental Cr[1]		65	75	72	m	76	64	69
White Creek[2]		62	63	60	63	64	64	1
SF Desolation[3]		62	62	60	64	64	50	103
NFJD@Camas		ND	76	74	78	77	64	84
NF Meacham	Umatilla	67	70	68	69	69	50	95
Umatilla @FB (Corp.)		64	ND	64	64	64	50	99
NF Touchet @FB	Walla Walla	ND	59	55	57	59	61	0
Lookingglass@FB	Grande Ronde	55	55	55	55	56	50	36
NF Asotin @Lick Cr	Snake R (WA)	ND	69	65	70	67	61	66
SF Asotin @FB		ND	60	67	60	61	61	0
Panjab Cr		58	60	60	60	60	61	0

ND=No Data
FB=Forest Boundary
1 Streams in 1996 Tower fire area *Moved to new location
2 Stream in 1994 Boundary fire area
3 Stream in 1996 Summit fire area

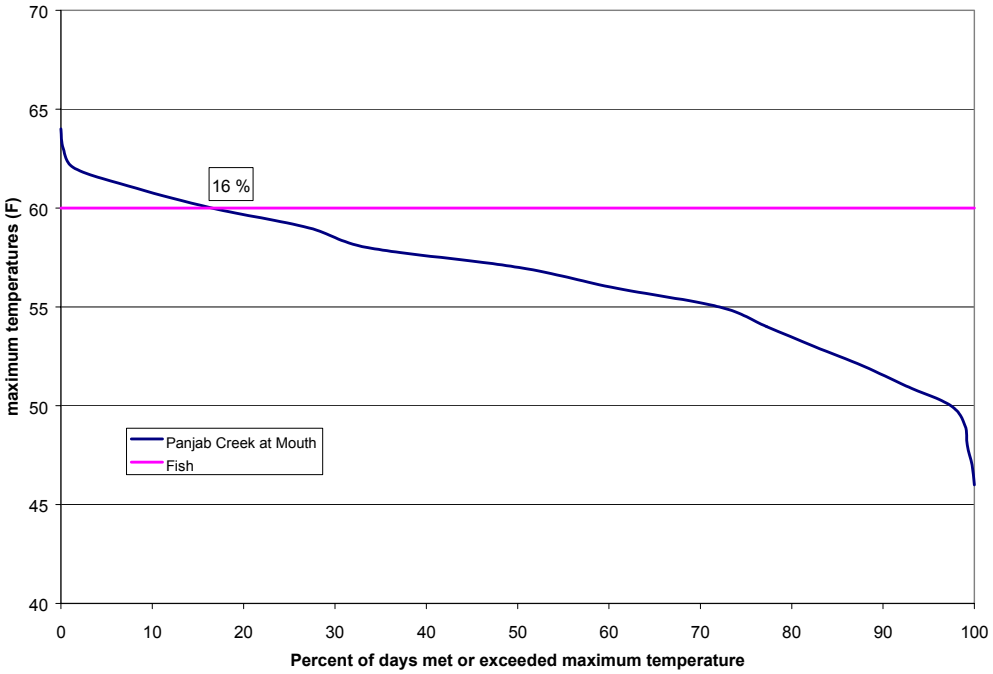
Changes in monitoring protocols were implemented in 1999 to be consistent with the State of Oregon water quality monitoring guidebook (Oregon Plan for Salmon and Watersheds, 1999). These include: purchase of a NIST-traceable calibrated thermometer to check accuracy of field thermographs and thermometers, and mid-season field audits. Results for 1999 and 2000 were submitted to Oregon Department of Environmental Quality, as part of the 2002 303(d) data submission, and data for 1999-2001 are on file.

Discussion:

Five or more years of thermograph data are available for many stations across the Forest. These data show year-to-year variability and provide some indication of temperature trends following wildfire. While many streams are not meeting state water quality standards, water quality management plans are being developed to address impairment, for example as part of the Upper Grande Ronde and Umatilla TMDLs. Specific actions recommended in these documents include improving stream shade and stabilizing stream banks. In some cases, achieving target temperature standards may take 50 to 100 years, time for coniferous vegetation

to reach maturity. In other situations, targets may not be attainable due to natural conditions. Large disturbances such as wildfire may also delay recovery: depending on extent and intensity of the fire, riparian vegetation may take 5 to 100 years to recover (Table U-4). Project-level activities implemented over the last 5 years to improve riparian shade and stream temperatures include: floodplain restoration (North Fork John Day), forest-wide road treatments (upgrade and obliteration), and planting riparian shrubs (North Fork John Day).

Figure U-4
PERCENT OF DAYS PANJAB CREEK MET OR EXCEEDED 60 DEGREES F
July 2 to September 24, 1997-2001



Temperature monitoring strategies continue to evolve with changes in technology, monitoring objectives, and regulatory requirements. Analysis shows which sites have stable temperature patterns and may not need to be continuously monitored. For example, stream temperatures in Jarboe Creek, a tributary to Lookingglass Creek, have been monitored to examine the effect of cattle removal and to determine the influence of East Fork Jarboe Creek on downstream temperatures. Since 1989 up to five water temperature data loggers have been in operation. In the mid-1990s the USFS acquired private grazing land along Jarboe Creek and in 1995 cattle were removed from that area. Two thermographs were located above and below the grazed area, and two were above and below East Fork Jarboe Creek. Statistical analysis showed that stream temperatures have not significantly changed since cattle were removed (Figure U-6). Stream temperature also did not substantial vary between the above and below East Fork Jarboe sites and between the Forest boundary and road 62 sites, suggesting that East Fork Jarboe Creek does not significantly affect the water temperature of Jarboe Creek. Considering project priorities and cost to maintain sites and analyze data, four of five sites were determined unnecessary for characterizing stream temperatures at this time and have been discontinued. Jarboe at the Forest boundary will remain active because this location characterizes conditions of the main tributary at the point the stream leaves USFS lands.

Other sites are being monitored year-round to better understand stream conditions during times when fish are spawning (fall and spring).

Figure U-5
DESOLATION CREEK – FLIR DERIVED STREAM TEMPERATURES

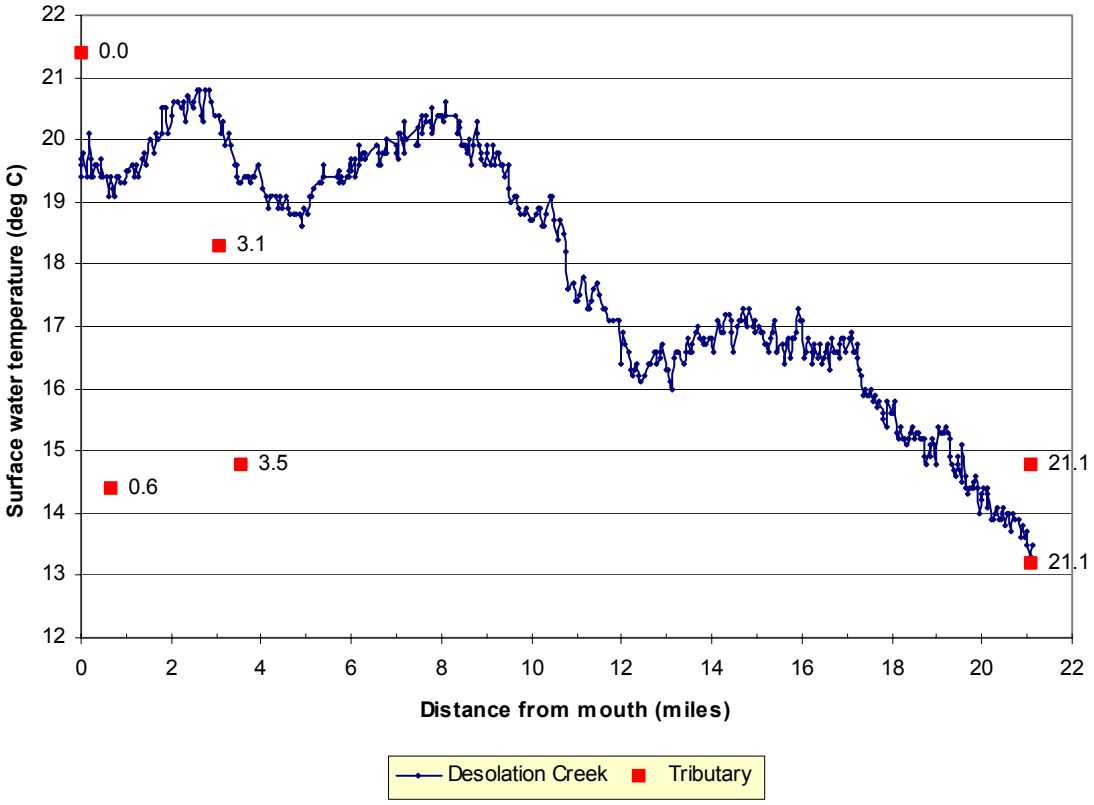
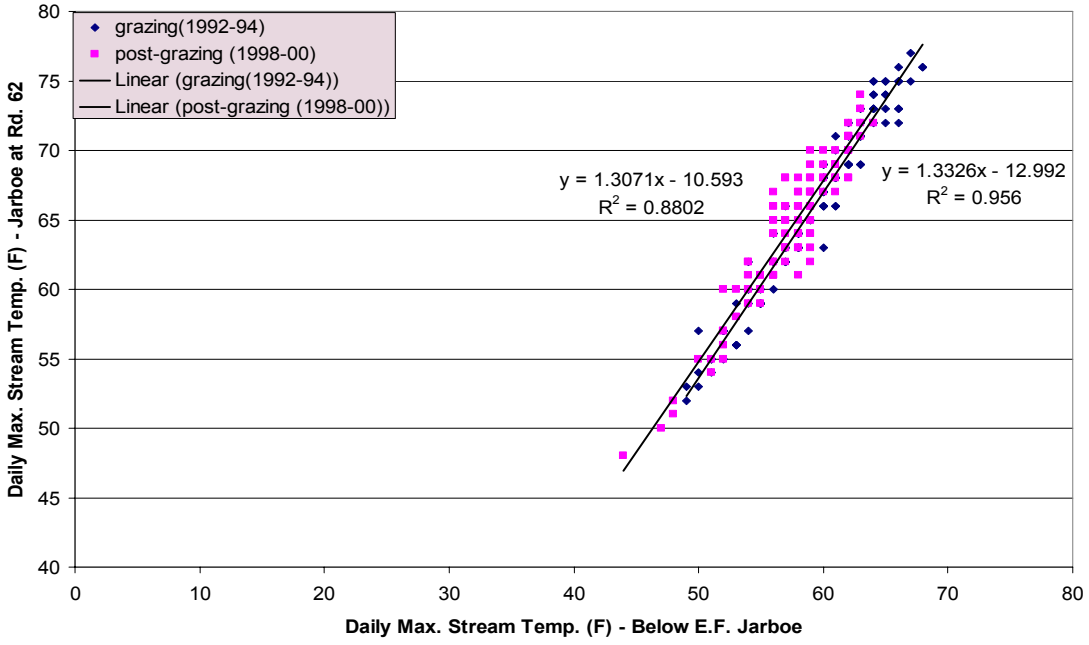


Figure U-6
JARBOE CREEK DAILY MAXIMUM STREAM TEMPERATURES
Grazing and Post-grazing period



Evaluation and Recommended Actions:

- Continue analyzing the backlog of temperature data: use analysis of data above-and-below or before-after activities (more likely to show trends).
- Strategically locate permanent long term monitoring stations and develop specific objectives for project monitoring.
- Continue to implement management activities consistent with Water Quality Management Plans in TMDLs for improvement of riparian shade and channel morphology.
- Use longer-running sensors for year-round monitoring at sites where spawning or anchor ice is an issue.
- Continue Quality Assurance/Quality Control documentation, including mid-summer audits.

Stream Sedimentation
Item 6

Questions: Are Forest streams meeting state water quality standards for sediment (NTUs)? How are Forest management activities and/or natural events affecting the rate of stream sedimentation or potentially impacting beneficial uses? Is stream sedimentation impacting critical components of stream fish habitat? What is the cumulative impact of changes in stream sedimentation on water quality and fish habitat?

Stream sedimentation continues to be an important water quality concern in some areas of the Forest. High levels of fine sediment (< 6 mm particle size) have been shown to impair habitat and biological functions. Stream channels adjust their form to changes in sediment supply, for example becoming wider and shallower in response to increases in sediment. Accelerated sediment supplies often occur as a result of land-disturbance from management activities (mining, grazing, logging, road construction, recreation development) or natural disturbances (floods, fires, and landslides).

Oregon and Washington states have established water quality criteria for turbidity (numeric standards) and sedimentation (narrative). Biological criteria for fine sediment are included in the Forest Plan Monitoring Strategy based on cobble embeddedness. Methods for monitoring instream sediment include: water sampling using semi-automated pumping samplers (turbidity and Total Suspended Solids, or TSS), and substrate sampling using measured or estimated embeddedness, and Wolman (1954) pebble counts.

Geology and stream type play an important role in determining sediment sources, and the fate of sediment entering streams. On the Umatilla Forest, the highest potential sediment source areas are the granitic rock types and landslide-prone terrain in the upper North Fork John Day Subbasin. The majority of streams across the Forest, perennial and intermittent, are moderate to high gradient source and transport-type streams (Montgomery and Buffington, 1993). In general, these stream types are not susceptible to fine sediment accumulations. Lower gradient (<2 %) response reaches occur in the main valleys of larger streams: Asotin Creek, Tucannon River, Touchet River, Walla Walla River, Umatilla River, Meacham Creek, and the upper North Fork John Day River and its major tributaries (Desolation, Granite, Camas, and Wall Creeks). Low gradient meadow systems in the higher elevations are also areas of sediment accumulation. Examples include: Brock-Jarboe Meadow, Granite Meadows, Desolation Meadows, and Kelly Prairie. Sediment deposition is of greatest concern in granitic watersheds, in landslide-prone terrain, and in lower gradient stream types (mainstem valleys and mountain meadows). Streamside developments (including roads, trails, dikes, and campgrounds) in larger stream systems restrict floodplain areas and promote channel incision (deepening). Accelerated streambank erosion resulting from down-cut channels is also a source of sediment to streams.

Sediment monitoring in mountain streams poses numerous technological challenges. High spatial and temporal variability is inherent in production, transport, and deposition processes making sediment one of the most challenging water quality parameters to measure. For example, in a 10-year period (1988-1997) annual suspended sediment loads on the upper Umatilla River were shown to vary by an order of magnitude (Harris and Clifton, 1999).

Unit sediment loads (in mass per unit area) represent sediment production distributed over a watershed, and are useful in comparing temporal and spatial variability. Annual unit suspended sediment loads were calculated for each station (Table U-5). Annual loads for the Umatilla River at Corporation ranged from 14 tons/mi^2/yr in WY97, to 197 tons/mi^2/yr in WY93, an order of magnitude difference in annual load. Overall, year to year variability in suspended sediment loads is the result of variability in weather conditions, storm events, sediment sources, and storage on hillslopes, floodplains, and channels.

Table U-5
ANNUAL SUSPENDED UNIT LOADS (TONS/MI2)
Umatilla Barometer Watershed

	WY 88	WY 89	WY 90	WY 91	WY 92	WY 93	WY 94	WY 95	WY 96	WY 97
Umatilla @ Corp	N/A	N/A	60	93	24	197	33	143	45	14*
North Fk. Umatilla	109	354	71	40	42	251	52	149	21	42*
South Fk. Umatilla	2.4	4.1	36	70	18	39	13	28	37*	12*

N/A Not applicable, measurements not representative of entire year
* Limited data available

Touchet River sediment analysis summary

Three sites on the North Fork Touchet River were monitored for turbidity, total suspended solids, total dissolved solids, and conductivity from 1986 to 1998. General objectives were to evaluate the contribution of Bluewood Ski Area and Forest Service Road 64 to stream turbidity, and compliance with Washington water quality standards. Results from 1986-1996 were previously reported in the 1994 and 1996 Forest Plan Monitoring Reports.

The Washington State standard for turbidity for North Fork Touchet River specifies that turbidity shall not exceed 5 NTU over background turbidity when the turbidity is 50 NTU or less. For the North Fork Touchet monitoring sites below Bluewood Ski Area, data from 1986-1994 indicate that turbidity violations were most common in the time period from 1986-1989. Turbidity exceeded State standards 5-62 days during this period each year. From 1990-1994, turbidity violations dropped off significantly, ranging from 2-12 days each year.

The time period 1997-1998 was the latest data available for these sites. These data were evaluated, and turbidity violations were determined. Violations occurred at the North Fork Touchet site below Skyline. No violations occurred at the North Fork Touchet near the Forest boundary.

Twenty turbidity violations occurred during these 2 years, with 7 in 1997, and 13 in 1998. These data values are generally low compared to the years 1986-89, and are similar in magnitude to previous data collected 1990-94. No violations were recorded at the Forest Boundary site for this time period suggesting that the greatest effect on turbidity during the time period 1997-98 is from management activities at the ski area, rather than Forest Road 64. For previous years, turbidity violations were generally more common directly below the ski area compared to further downstream at the Forest Boundary. Thus, Forest Road 64 appears to be having less of an effect on turbidity than the ski area, access road 6400-650, and parking area.

Tucannon River sediment analysis summary

Total suspended solids (TSS) and turbidity data from two monitoring stations on the Tucannon River (Tucannon at the Forest Boundary and Tucannon at Panjab) were analyzed with the general objectives of characterizing sediment regimes in the upper Tucannon River and comparing the two sites. High levels of fine sediment in streams adversely impacts aquatic life, reduces habitat quality, and may cause channel widening.

In a comparison of sediment data over time, complete data sets representing the range of actual values are ideal for analysis, however, data for these stations had numerous and inconsistent data gaps caused by weather conditions (freezing) and equipment failure. Water years with sufficient data were used to represent the yearly range of data. Both sites show annual and seasonal variability in TSS. Years in which the sampler captured both the maximum and minimum values show within-year and annual variability. The largest within year variability occurred at the Forest boundary in 1982, TSS values range from 0 to 2727 mg/L.

Variability in TSS between years was also high. In the 8 years of comparable data from the Forest boundary, maximum TSS ranged from 64 to 2727 mg/L (standard deviation 5 to 403 mg/L). At the Panjab site, maximum TSS ranged from 63 to 678 mg/L (standard deviation 6 to 101 mg/L). Minimum TSS values were consistently below 3 mg/L at the Forest boundary but ranged between 0 and 11 mg/L at Panjab.

TSS concentrations were consistently higher at Panjab compared to the Forest boundary during the period January 25 through September 6 for the years 1984, 1992, and 1998. Possible reasons why Panjab showed higher TSS concentrations include:

- change in the dominant stream type from a higher gradient source/transport reach, using Montgomery and Buffington's 1996 system (Rosgen, 1997 types A and B), to a lower gradient response reach (Rosgen B/C and C type),
- change in road maintenance levels (paved to gravel),
- local sediment sources (streambanks or landslide areas) above Panjab.

The cause of peak flows may be another source of differences between the sites. The timing of maximum TSS concentrations at each site occurred during different runoff periods. The majority (63 percent) of the peak TSS values occurred during the rain-on-snow period at the Forest boundary, while 57 percent of peak TSS values occurred during the spring melt period at the Panjab site. The Forest boundary, at a lower elevation, may be subject to more rain-on-snow-generated flooding. These floods do not occur every year. Panjab, at higher elevation, is more subject to a snow-melt floods, an annual phenomenon.

Umatilla River Sediment TMDL

Targets for sediment and goals for sediment reductions were developed in the Umatilla Subbasin Total Maximum Daily Load and Water Quality Management Plans (Oregon Department of Environmental Quality, approved 2001). Turbidity targets were based on studies of impacts to fish. Sediment loads were modeled using relationships between turbidity and total suspended sediment. Overall, Forest watersheds have a negligible contribution to downstream sediment, and no load reductions were assigned to the Forest. However, management plans specify the importance of control of sediment during Forest operations through application of Best Management Practices.

Stream substrate

Between 1995 and 2001, over 40 permanent stream channel reference reaches were installed on Forest streams. Field survey included channel cross-sections, longitudinal profiles, and substrate. The majority of reference reaches were established to monitor stream response to large flood and fire events in 1996.

Evaluation and Recommended Actions:

Monitoring results continue to show high spatial and temporal variability of suspended sediment in Forest streams. Trends are apparent in project-level data such as the North Fork Touchet River. Post 1996 flood and fire monitoring data show streams adjusting to increased sediment inputs through reach-level channel adjustments and shifts in dominant substrate size. Overall, given the variability of sediment transport and deposition in streams, watershed-scale trends are difficult to monitor and detect.

- Continue sediment monitoring on the NF Touchet, and implement management activities to reduce sediment from the Bluewood Ski Area.
- Continue Channel Reference Reach surveys on a 5-year cycle or after major disturbances from floods and fire.
- Evaluate new methods for sediment monitoring such as instream turbidity sampling, substrate sampling, and videography.
- Identify key stream reaches where fine sediment is a concern to aquatic resources and focus monitoring in these areas.

Anadromous and Resident Fish
Item 22

Questions: Are the population trends for anadromous and resident fish Management Indicator Species stable to improving? Are Forest Plan goals, objectives, and desired conditions for anadromous fish being achieved? Is fish habitat capability improving as projected in the Forest Plan?

Summer steelhead trout *Oncorhynchus mykiss* and resident redband trout *Oncorhynchus mykiss gairdneri* were recognized as management indicator species for streams and riparian habitats in the Forest Plan. Habitat requirements of the selected species were presumed to represent those of a larger group of species. Summer steelhead and redband are among the most well distributed fish species on the Forest. While they don't require the coldest water of species on the Forest, they do require good water quality.

All anadromous fish in Region 6 were added to the Regional Forester's Sensitive Species List in August 1997. Even though steelhead was selected in 1990 to represent anadromous fish and redband trout was selected to represent resident fish, it is now necessary to assess the status of all anadromous fish with emphasis on those listed under the Endangered Species Act to monitor Forest Plan performance. An updated list of Aquatic Management Indicator Species would include all stocks of steelhead trout *Oncorhynchus mykiss*, chinook salmon *Oncorhynchus tshawytscha*, bull trout *Salvelinus confluentus*, resident redband trout *Oncorhynchus mykiss gairdneri*, and margined sculpin *Cottus marginatus*.

Resident redband trout, a subspecies of rainbow trout east of the Cascade Mountains, may share a common gene pool with anadromous steelhead trout in the same geographic area. Resident fish are generally considered part of the steelhead Evolutionary Significant Unit (ESU) but may not be included when an anadromous life form is listed under the Endangered Species Act. The National Marine Fisheries Service did not include resident redband trout in the steelhead listings.

Steelhead

Steelhead trout in the Snake River ESU were listed under the Endangered Species Act as a threatened species in August 1997. The status of Snake River steelhead on the Umatilla National Forest was reviewed as part of project screening required by the National Marine Fisheries Service (NMFS) in August 1998. A summary of information used in that review along with current survey results are presented here.

Prior to 1970, annual returns of native steelhead to the Tucannon River were estimated by the Washington Department of Fisheries (WDF et al., 1990) to average 3,400 fish or 3 percent of the total Snake River steelhead run return. The estimated number of returning wild fish has steadily declined since 1988 (Table U-6).

Table U-6
ESTIMATED WILD STEELHEAD ESCAPEMENT -- TUCANNON RIVER
Marengo Bridge to Sheep Creek (Schuck 1997)

Year	# Wild Steelhead	Year	# Wild Steelhead
1987	376	1992	133
1988	418	1993	69
1989	255	1994	103
1990	333	1995	116
1991	168	1996	63

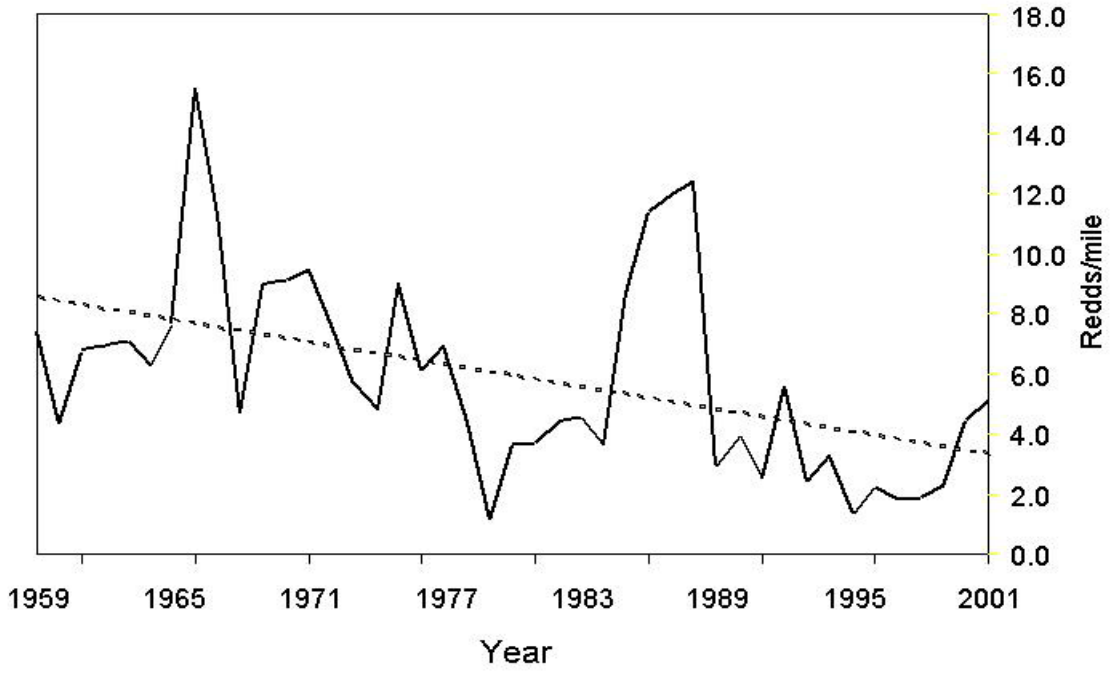
In the fall of 1997, a permanent adult steelhead and salmon trap was installed at the Tucannon Fish Hatchery by the Washington Department of Fish and Wildlife. The trap was checked daily by hatchery personnel beginning in October 1997, continuing through June 30, 1998 (WDFW 2000). Fifteen wild steelhead and 60 steelhead of hatchery origin were trapped and passed upstream at Tucannon Fish Hatchery site in the first

year of operation. In 1999, 22 natural-origin steelhead were captured at the trap and in 2000, 16 natural-origin steelhead were captured.

Asotin Creek supported a run of over 1,000 steelhead from 1954 to 1961 (Schuck, personal communication). The annual return from 1986 to 1998 was estimated at between 120 and 170 adult. The number of returning adults was below the Washington State escapement goal of 225 spawning steelhead. The estimated escapement of natural spawners to Asotin Creek for 1999 through 2001 is 371, 231, and 543 (WDFW 2002). Spawning habitat on the Forest is restricted to approximately 10 miles of the North Fork of Asotin Creek. Other steelhead tributaries with headwaters on the Forest are Charlie Creek, George Creek, and South Fork Asotin Creek.

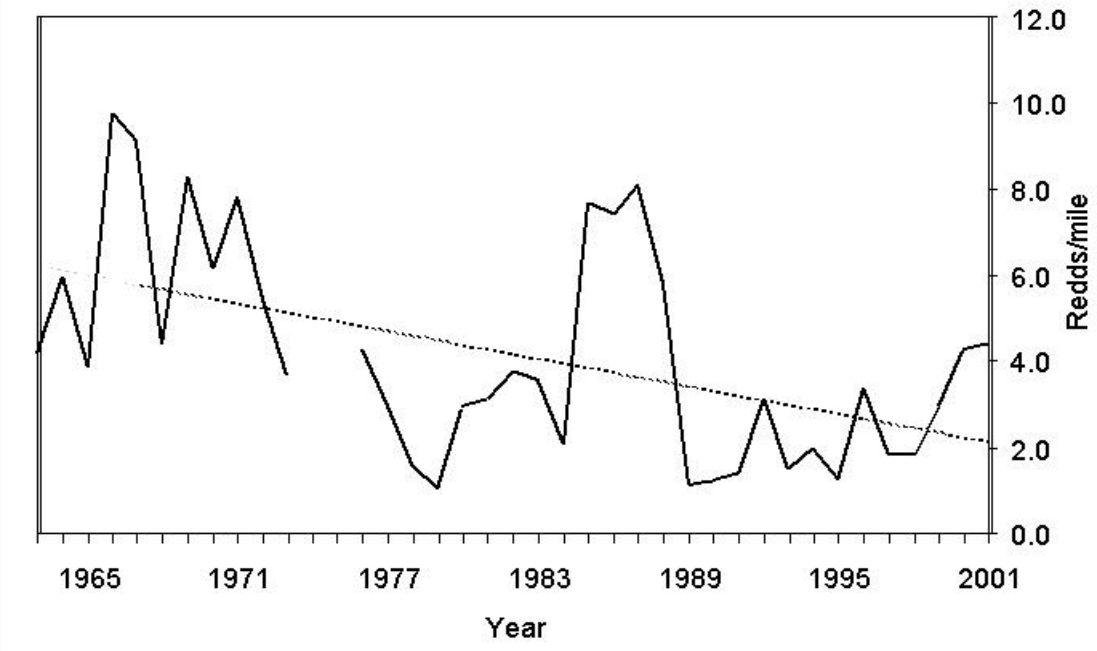
On March 25, 1999, the Steelhead in the Mid-Columbia ESU were listed by NMFS under the Endangered Species Act as a Threatened species. The John Day, Umatilla, and Walla Walla River drainages are in the Mid-Columbia ESU. Biological Assessments of on-going and proposed activities were prepared to document the environmental baseline and assess effects of Federal actions.

Figure U-7
JOHN DAY BASIN STEELHEAD REDD COUNTS, 1959-2001



Mid-Columbia redd counts for the John Day Basin (Figure U-7), and the North Fork John Day River (Figure U-8) show a declining trend over the length of time data has been collected with a slight rebound in the last 5 years. Spawning ground survey results in the spring of 2002, when added to this data set, will add to the recent rebound. An extensive survey conducted on the Heppner Ranger District within the North Fork John Day drainage spring 2002 documents a record 78 redds on 16 streams extending Mid-Columbia spawning higher in the watershed then previously reported, and documenting spawning on several streams for the first time in our survey efforts (Tom McLain, personal communication).

Figure U-8
NORTH FORK JOHN DAY RIVER STEELEHEAD SURVEYS, 1963-2001



Chinook Salmon

The Oregon Department of Fish and Wildlife (ODFW) established spring chinook spawning distribution and abundance index reaches in the John Day River drainage in 1959. The purpose of the monitoring is to document the Chinook spawning trends in the basin. Redds are counted on representative reaches of stream each year. Index reaches on the North Fork John Day River, Granite Creek, Clear Creek, and Wenaha River are on the Umatilla National Forest

Figure U-9 displays the redd count trend summarized in redds per mile for the John Day basin with data from the last 41 years. The long-term trends for spring Chinook redd counts on the North Fork John Day River is slightly up as shown in Figure U-10 and down for the Granite Creek system, Figure U-11, which includes both the Granite Creek and Clear Creek index sites.

Figure U-9
JOHN DAY RIVER BASIN SPRING CHINOOK REDD COUNTS, 1959-2001

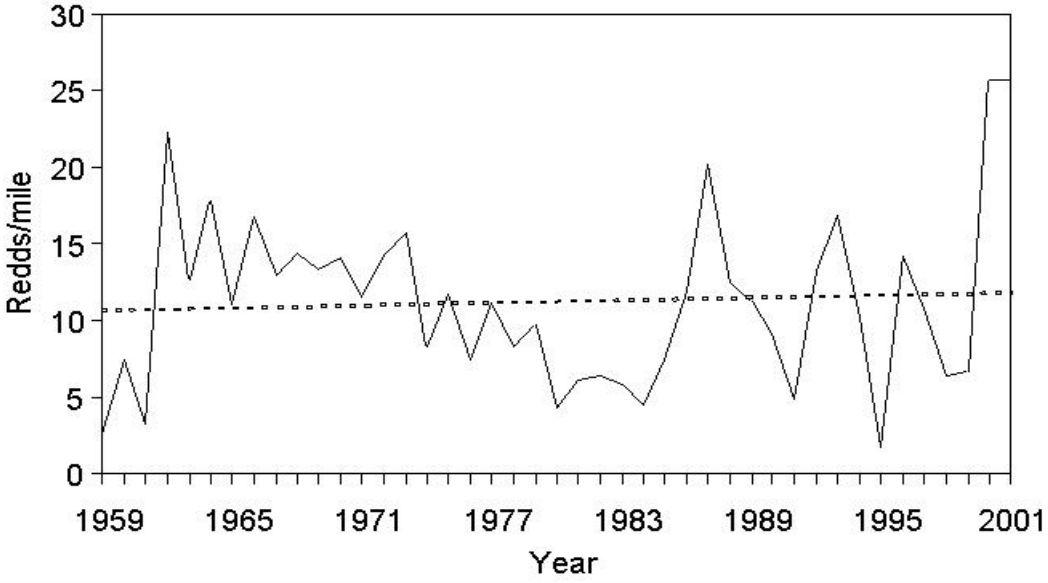
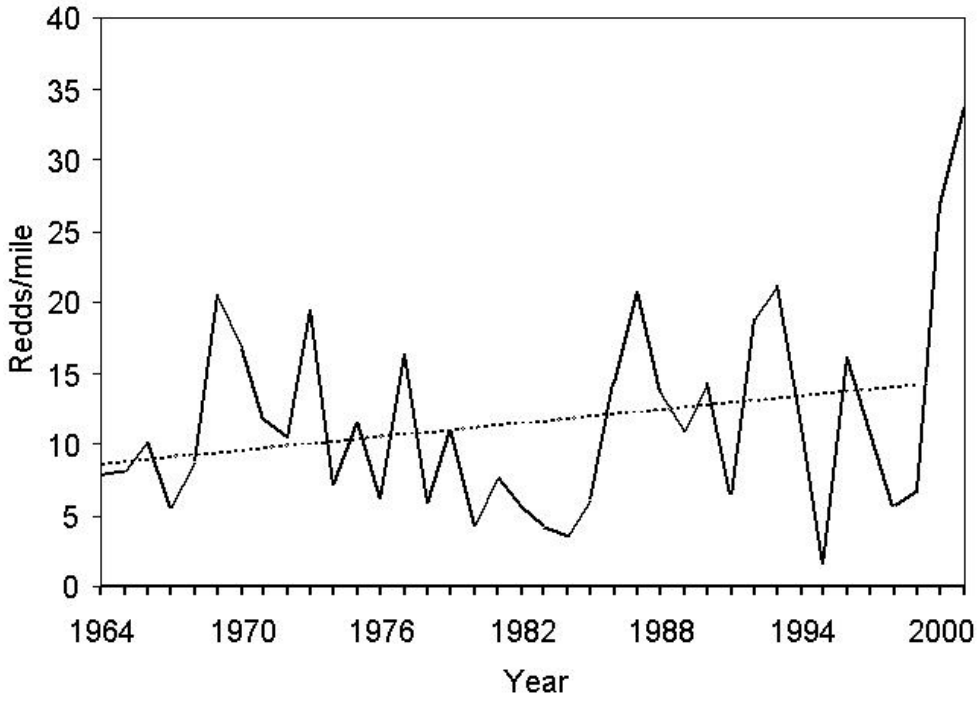


Figure U-10
NORTH FORK JOHN DAY RIVER CHS REDD COUNTS, 1964-2001

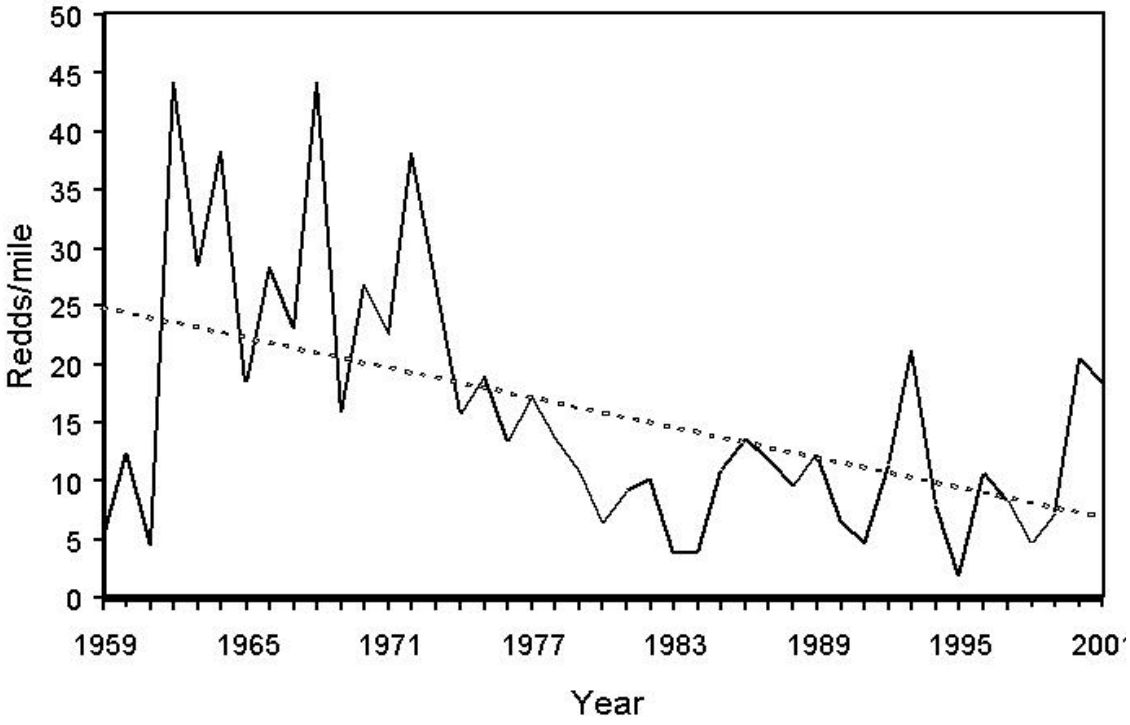


Spring Chinook spawning was way up in 2000 and 2001 as shown in Table U-7 in a summary of the last 8 years of data from index reaches on the North Fork John Day River and its tributaries Granite Creek and Clear Creek.

Table U-7
ODFW CHINOOK REDD COUNTS - REDDS/MILE
North Fork John Day River Drainage

Index Reach	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
North Fork John Day	18.8	21.1	11.2	1.5	16.2	10.9	5.6	6.7	26.9	33.7
Granite Creek	16.5	19.8	14.5	2.2	14.7	10.0	8.4	11.6	28	18.9
Clear Creek	11.7	25.6	4.0	2.8	9.5	7.2	2.8	3.8	20	20

Figure U-11
GRANITE CREEK SYSTEM CHS REDD COUNTS, 1959-2001



The National Marine Fisheries Service listed the Snake River spring chinook salmon and Snake River fall chinook salmon as threatened species in May 1992. Critical habitat was designated for both species in December 1993. Fall chinook and their critical habitat are not found on the Umatilla National Forest but are downstream from several of the Forest's Snake and Columbia River tributaries. Snake River spring chinook are found in the Tucannon watershed and major Grande Ronde tributaries on the Forest. Table U-8 lists data from index reach monitoring within the Wenaha River wilderness on the Forest.

Table U-8
CHINOOK COUNTS BY INDEX REACH -- OREGON

	Year	No. of Redds	No. of Carcasses	No. of Live Fish
ODFW MEASUREMENTS				
S. Fork Wenaha River (above Milk Cr. to Forks)	1994	12	0	2
	1995	2	0	1
	1996	28	3	16
	1997	35	9	11
	1998	24	11	13
	1999	-	-	-
	2000	57	13	27
Wenaha River (Forks to Crooked Creek)	1994	30	5	18
	1995	18	3	10
	1996	69	11	54
	1997	33	27	18
	1998	38	12	31
	1999	-	-	-
	2000	61	19	48
Milk Creek (tributary of Wenaha River	1994	0	0	0
	1995	0	0	0
	1996	0	0	0
	1997	0	0	0
	1998	0	0	0
	1999	-	-	-
	2000	0	0	1
Butte Creek (tributary to Wenaha River)	1994	0	0	0
	1995	1	0	0
	1996	5	1	3
	1997	4	1	0
	1998	3	0	0
	1999	-	-	-
	2000	1	0	1

Chinook salmon spawning escapement potential prior to mainstem Columbia River and Snake River dam construction was estimated at 20,000 fish (Van Cleave and Ting, Oregon Fish Commission, unpublished report). Actual escapement in 1957 was estimated at 12,200 spring chinook (ODFW, 1990). An estimated 8,400 spring chinook returned to the Grande Ronde subbasin in the early 1970s (Smith, 1975). Since 1975, Grande Ronde spring chinook must pass a total of four mainstem Columbia River dams and four mainstem Snake River dams. Annual escapement estimates by ODFW for 1977 through 1987 range from 324 to 1,715. Chinook counts by index reach within the Wenaha Wilderness are displayed in Table U-8. Chinook numbers have declined within the wilderness at approximately the same rate as other, more developed subwatersheds in the Grande Ronde subbasin (ODFW, 1990).

Lookingglass Creek is a tributary of the Grande Ronde River and was considered one of the major spring chinook producers in the subbasin. The wild spring chinook of Lookingglass Creek were incorporated in the Lookingglass Creek hatchery stock developed after completion of the hatchery in 1982. Although some returning adults are able to pass over the hatchery weir each year and spawn naturally, it is currently believed that these fish are of hatchery origin. The wild spring chinook population of Lookingglass Creek is extirpated.

Asotin Creek chinook spawning ground surveys conducted by the Washington Department of Fish and Wildlife (WDFW) were reported in the 1997 Annual Report for the Tucannon River Spring Chinook Hatchery Evaluation, September 1998. Spawning ground surveys have been conducted by WDFW since 1984. The results of these surveys are included in Table U-9. The WDFW concludes that the survey results indicate spring chinook salmon in Asotin Creek have been extirpated. Any adult salmon that return in future years will likely be strays from other basins.

Table U-9
CHINOOK SALMON COUNTS ON NORTH FORK ASOTIN CREEK - 1984-1987

Year	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Redds	21	8	1	3	1	0	2	0	0	2	0	0	0	0
Live Fish	12	7	3	6	0	0	0	0	0	0	0	0	0	0
Carcasses	5	1	0	0	0	0	0	0	0	1	0	0	0	0

Historic Tucannon River runs of spring chinook salmon averaged approximately 2,400 adults annually (WDFW, 1992). The Lyons Ferry and Tucannon hatcheries were built with a mitigation goal of 1,152 spring Chinook salmon of Tucannon River stock under the Lower Snake River Compensation Plan. The hatcheries were to compensate for the loss of spring Chinook production due to hydroelectric development. The mitigation goal of 1,152 spring Chinook has not been achieved. Data published in the Tucannon River Spring Chinook Salmon Hatchery Evaluation Program (WDFW, 2000) and conclusions reported suggest that the natural spring Chinook salmon population is being replaced by hatchery stock.

Spring Chinook returning to the Tucannon River are stopped at the Tucannon Fish Hatchery trap. Fish are not passed above the trap but each year a few fish have been found above the trap. It is thought that they jump the hatchery intake dam during high spring flows. Natural spawning is not taking place on the National Forest. There is natural spawning below the Tucannon Fish Hatchery trap.

Bull Trout

Columbia River bull trout (*Salvelinus confluentus*) were listed as a threatened species by the U.S. Fish and Wildlife Service in June 1998. Bull trout are present on the Umatilla NF in the Umatilla, Walla Walla, Tucannon, Asotin, Wenaha, Lookingglass, and North Fork John Day drainages. The Forest, in cooperation with Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, and Confederated Tribes of the Umatilla Indian Reservation, have been conducting bull trout spawning surveys within the Umatilla, Walla Walla, Tucannon, and Wenaha Rivers, and Lookingglass Creek drainage. Results are displayed in Table U-10, which follows. Additional time is needed to determine population trends.

Table U-10
BULL TROUT REDD COUNTS

		Total Bull Trout Redd Count							
Subwatersheds	**Miles Surveyed**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Tucannon	8.5	131	114	184	78	108	222	151	68
Looking-glass Creek	12.3	15	16	29	39	62	57	53	54
Touchet	8.2	86	27*	64	41*	95	146	117	240
Mill Creek	15.7	191	165	134	118	137	190	191	220
S.F. Walla Walla	21.5	143	114	177	180	276	431	336	452
Umatilla	18.7	39	22	37	32	84	154	143	97
TOTAL	84.9	605	458	625	488	762	1,200	991	1131

*Counts may be low due to late season monitoring (Wolf Fork).

Almost all subwatersheds on the Umatilla National Forest contain habitat for at least one listed aquatic species. The Forest will work closely with the Regulatory Agencies toward recovery of the listed species and restoration of their designated critical habitat.

Five-year Review

Forest Plan fish indicator species are steelhead trout *Oncorhynchus mykiss* and resident redband trout *Oncorhynchus mykiss gairdneri*. Populations for Snake River steelhead trout on the Umatilla National Forest monitored in the Tucannon and Asotin drainages show a declining population trend over the past decades of monitoring. Mid-Columbia steelhead trout populations monitored by spawning ground surveys in the John Day drainage show a declining population trend. The last three years of improving redd survey results in Asotin Creek and the John Day drainage is encouraging but will need to be sustained to reverse the declining trend.

Our best population trend data on resident inland redband trout is from the Tower Fire Study with preliminary unpublished results reported in the 2000 Forest Plan Monitoring Report. No trend for resident fish management indicator species can be determined at this time.

The PACFISH/INFISH Effectiveness Monitoring conducted in the Interior Columbia Basin area will be our best monitoring tool to determine trends in fish habitat condition on the Forest. The Biological Assessments for ESA listed fish also document baseline habitat conditions on the Forest. All streams on the Umatilla National Forest are within the PACFISH management area. Endangered Species Act aquatic species are found throughout the Forest. Proposed projects on the Forest in the past 5 years have been reviewed by the ESA Regulatory Agencies for compliance with the Endangered Species Act and PACFISH. Proposed projects that may affect fish habitat typically have a long-term beneficial effect on aquatic habitat with mitigation designed to minimize short-term detrimental effects.

Evaluation and Recommended Action:

- The Forest Plan Revision effort will be an opportunity to review fish population viability on the National Forest in relation to ESA recovery efforts in the Columbia River Basin. It is well recognized that the recovery of listed species in the Columbia Basin will require a coordinated effort across all land ownerships and actions that effect salmon. Fish habitat on the National Forest is generally in better condition then habitat on non-federal land. Through consultation with the Regulatory Agencies, the Forest will protect habitat that is in the best condition and work to restore fish habitat that presently supports fish populations at lower levels because habitat is in poorer condition.

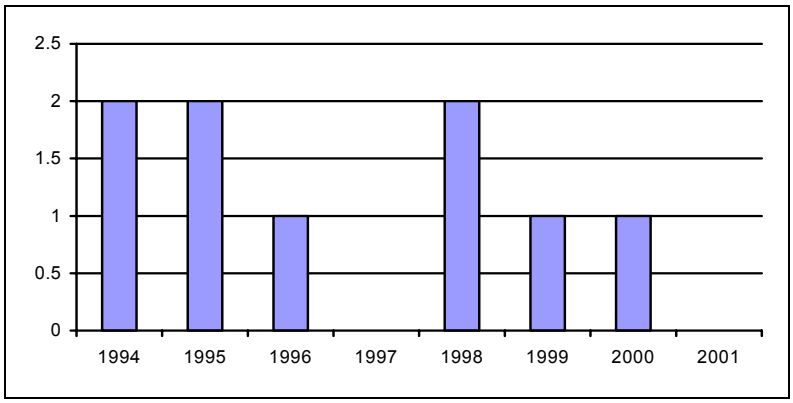
Threatened/Endangered/Sensitive Wildlife Species
Item 28

Questions: Bald Eagles: *Are potential habitats, including nest sites, communal roosts, and associated foraging habitats, being identified and planned to assure species recovery as specified in the Recovery Plans and in the Forest Plan? Are wintering populations stable or increasing?*
Peregrine Falcons*: Are nesting and associated foraging habitats being identified? Are potential nest habitats identified and being managed to maintain suitability?*
Sensitive Species*: Are potential habitats being identified and protected to maintain identified species and to ensure management standards are being met?*

Bald Eagle

Monitoring occurred at the Dry Creek bald eagle nest site in fiscal year 2001. No young fledged this year. Since 1994, this nest has fledged nine eaglets, for an average of 1.1 eaglets fledged per year, Figure U-12. In 1999, the Heppner Ranger District implemented the Dry Creek site-specific management plan.

Figure U-12
DRY CREEK EAGLE NEST SITE
Number of Eaglets Fledged



A potential nest on the North Fork John Day River was checked in the spring, summer, and winter. Golden eagles are currently using this nest.

Two winter bald eagle survey routes monitored since 1991 on the North Fork John Day Ranger District were run in January 2001. The survey resulted in no active winter roosts along the route in 2001.

Five-Year Review:

Bald eagles are consistently using the North Fork John Day River, Camas Creek, and the Ukiah valley each winter. The number of bald eagles counted in the mid-winter survey fluctuates from year to year, and variables such as weather and opportunistic food sources make it difficult to assess trends. Production at the Dry Creek nest site at 1.1 eaglets/year is considered relatively good. If all known offspring survived since 1994 when the nest was first found, there would be five birds of breeding age. Although nesting habitat is seemingly available, bald eagles have not expanded into other portions of the North Fork John Day River. Currently 11 breeding pairs are known in the Blue Mountains (Recovery Zone 9).

Canada Lynx

The third and final year of field surveys was conducted on the North Fork John Day Ranger District to determine presence of lynx using the National Survey Protocol. The detection method used a scented, studded carpet pad to collect hair. Approximately 125 square miles were surveyed. Carpet pads were collected and sent in for DNA analysis, and no lynx were detected.

Five-Year Review:

Using tested methods that are known to detect lynx (McKelvey), a large area of suitable habitat was surveyed for 3 consecutive years. Since no lynx were found it appears that the North Fork John Day Ranger District does not have a resident population at this time.

Peregrine Falcon

A potential peregrine falcon nest site on the North Fork John Day Ranger District was surveyed to protocol and no falcons were observed. Incidental falcon sightings continue to occur in July and August at various locations on the Forest. These late season observations could be dispersing juveniles or individuals migrating through the area. The Forest has no documented peregrine falcon eyries.

Five-Year Review:

The Umatilla Forest has no documented peregrine falcon eyries. Potential falcon habitat has been identified. Aerial surveys on the NFJD district occurred in five separate years, and ground surveys have occurred sporadically. Active prairie falcon eyries have been located. The peregrine falcon was delisted by the U.S. Fish and Wildlife Service, but is now included on the Regional Forester's Sensitive Species List.

Sensitive Species

Each project "Specialist Report" or Biological Evaluation identifies and provides protective measures for Sensitive species potential habitat on the Forest. These reports contain results of the evaluation, standards, and recommendations for managing those species.

Management activities in FY2001 did not adversely affect Threatened and Endangered (T&E) species or their habitat on the Forest. Potential impacts are typically reduced or mitigated to a "not likely to adversely affect" on the species. Effects on T&E species continue to be documented in the project Biological Evaluation or Biological Assessment. The Forest continues to use the project evaluation process to analyze T&E species and their habitat.

Five-Year Review:

The Umatilla Forest has consistently analyzed the effects of management actions on sensitive species, and has ensured that management actions do not resulted in a downward trend or loss of viability for such species.

Evaluation and Recommended Actions:

- Continue monitoring bald eagle nest sites and winter roosting routes on the Forest. Document results and/or findings in the NRIS-Fauna database.
- Survey for lynx on the Walla Walla Ranger District using the National Lynx Detection Protocol.
- Investigate peregrine falcon sightings for potential aeries on the Forest.
- Continue to analyze impacts to Threatened, Endangered, and Sensitive species and their habitats. Document finding and evaluations in the project Specialist Report and/or Biological Evaluation/Assessment.

Nonconforming Uses
Item 36

Question: Is the location, kind and amount on nonconforming uses acceptable and are wilderness standards being met?

Based on field observations, the primary types of nonconforming use occurring on the Walla Walla Ranger District are occasional mountain bike entry on trails during the summer, and occasional snowmobile entry in the flatter areas around the edge of the wilderness during the winter. While nonconforming use is not desirable, the amount of nonconforming use is at a low enough level that wilderness values are not being damaged.

Wilderness standards are being met.

Availability of Firewood
Item 44

Questions: How much firewood is being provided? Is sufficient fuelwood being offered to the interested public?

The Forest provided 3.8 million board feet of firewood in FY2001 (Table U-11), approximately 18 percent of the Forest Plan projected amount of 15 MMBF. Significant reductions in firewood sold in 2000 may have been a reflection of the locally mild winters over the past few years.

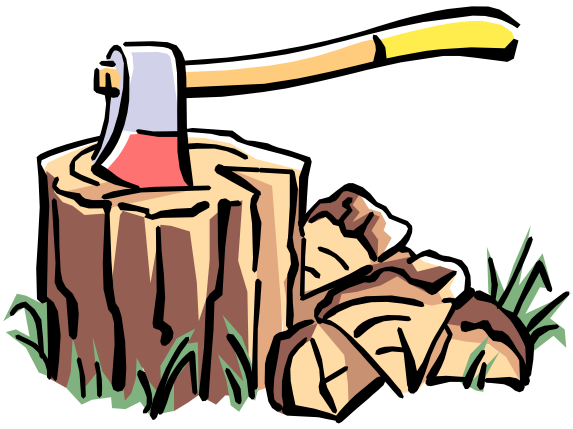
Table U-11
FIREWOOD PROGRAM - CHARGE PERMITS ISSUED 1989-2000

Year	Number	MMBF
1989	4,794	12.4
1990	3,871	8.0
1991	3,792	8.7
1992	2,838	6.8
1993	3,786	9.5
1994	2,373	5.5
1995	3,214	9.2
1996	2,115	5.9
1997	2,724	5.2
1998	2,308	4.0
1999	2,869	4.1
2000	1,787	2.7
2001	2739	3.8

The Forest continues to anticipate a surplus of firewood for the next several years, especially on the south end districts. However, the size and species of wood available and the increasing distance of available supplies from population centers may not meet public demand as well as has been possible in the past.

Evaluation and Recommended Action:

- Continue to monitor.



The following table provides a summary of selected Forest accomplishments and resource outputs for FY2001. Where possible, these are compared to Forest Plan estimates, but in many cases, the unit of measure has changed since the Forest Plan was completed and a direct comparison is no longer possible.

Table U-12
FOREST ACCOMPLISHMENTS – FISCAL YEAR 2001

Resource Activity/Output	Unit of Measure	Forest Plan Projection (Avg/Year)	Actual FY2001 Forest Output	% Actual to Forest Plan
FIRE				
Natural Fuel Treatment	Acres	3,400	5,671	167
Activity Fuel Treatment	Acres	5,800	1,039	18
FISH				
Anadromous Stream Restored/Enhanced	Miles	Not Specified	14	NA
Inland Stream Restored/Enhanced	Miles	Not Specified	3	NA
RANGE				
Permitted Grazing – Sheep & Goats				
Permitted Grazing - Cattle & Horses	AUM	58,000 (combined)		
Non-structural Improvements		Not Specified	141	NA
Structural Improvements		Not Specified	18	NA
Noxious Weed Treatment	Acres	Not Specified	9,981	NA
RECREATION				
Trail Construction/Reconstruction	Miles	30	8	27
Developed Recreation Capacity	PAOTS	255,000	1,000,000	392
ROADS				
Construction	Miles	92		
Reconstruction	Miles	94		
Decommission	Miles	Not Specified		NA
Obliterated	Miles	Not Specified		NA
THREATENED, ENDANGERED, and SENSITIVE SPECIES				
Aquatic Habitat Restored/Enhanced	Miles	Not Specified	3	NA
Terrestrial Habitat Restored/Enhanced	Acres	Not Specified	50	NA
TIMBER				
Total Program Sale Quantity	MMBF	159	17	11
Reforestation (planting)	Acres	4,400	1,369	31
Reforestation (natural)	Acres	3,100	4,425	143
Timber Stand Improvement	Acres	2,900	2,514	87
WILDLIFE				
Habitat Restored/Enhanced	Acres	10,000	1,380	14
Habitat Structures	Structures	75	5	7
WATER				
Watershed Improvements	Acres	454	112	25