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Clearwater National Forest
Soil and Water Monitoring Plan
1995



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Overview

This document is a compilation of fiscal year 1995 monitoring projects concerning the soil and water resources of the Clearwater National Forest. The primary goal of the water quality monitoring program is to determine if land management activities implemented are meeting Forest Plan standards and objectives. The format of this plan is that agreed to by the Northern and Intermountain Regions of the Forest Service and the Idaho Department of Health and Welfare.

The Forest has divided the monitoring strategy into two major areas; **on-site** and **instream** monitoring. On-site monitoring includes baseline, implementation, and Best Management Practice (BMP) effectiveness monitoring. Instream monitoring addresses the relations between land disturbing activities and water quality, and includes baseline, effectiveness, and validation monitoring. Monitoring in this plan is categorized into baseline, implementation, effectiveness, and validation. Each is described in detail.

Baseline

Baseline monitoring characterizes existing water quality conditions and long-term trends of stream systems. It also provides a control for assessing the effects of activities. Baseline monitoring sites were established to represent conditions on the Forest. Each site is intended to fulfill one or both of two primary objectives: 1) Identify long-term trends and variability; and 2) Control. Long-term sites provide information on the natural process, functions, and variability of streams and watershed systems over time. Many sites will also provide a control or basis to compare watersheds with similar climatic, physical, and hydrologic characteristics. Climatic stations, snow courses, and stream gages operated by the National Oceanic and Atmospheric Administration, Soil Conservation Service, and the Geological Survey complement the Forest's baseline network.

Implementation

Implementation monitoring documents whether prescribed practices were implemented as designed and in accordance with Forest Plan standards. Activities monitored include road construction and timber harvest operations. Evaluation of implementation monitoring results will be used to show compliance with the Idaho Forest Practices Act and fine-tune project plans to improve on-the-ground BMP implementation.

Contract and project administration constitutes ongoing implementation monitoring on developmental projects. This monitoring is done by timber sale administrators, engineering representatives, and contracting officers. Documentation is brief and is maintained in the project file.

Supplemental implementation monitoring will include field reviews by the Forest Hydrologist and Soil Scientist. Ten percent of harvest units and 100 percent of all new road construction will be evaluated each year. The primary objective will be to determine if BMPs identified in the project plans are implemented and correctly applied in a timely fashion. During the review, visual observations will be made to see if BMPs and Forest/Project plan standards are effective.

In the event of incorrect or inappropriate application of BMPs, or omission of prescribed BMPs, causes will be identified along with corrective or preventive actions. The inappropriate application or omission will be documented in a letter to the District Ranger with suggested methods to implement the specific BMP.

Effectiveness

Effectiveness monitoring shows if BMPs and project objectives are effective in controlling pollutants to planned levels or resource management objectives. They also determine if beneficial uses are protected. The intent is to focus on cause and effect relationships between land management activities and water quality. Effectiveness monitoring will be done mainly as a demonstration of project plan activities and BMP effectiveness. Effectiveness monitoring will be quantitative and use the least complicated measurements.

Effectiveness monitoring will usually be done on a sample basis to characterize typical conditions so that results can be extrapolated. Emphasis will be on major nonpoint source contributing activities, such as road construction, reconstruction, and maintenance, timber harvesting, and riparian area management.

Effectiveness monitoring results will be interpreted in terms of Idaho State water quality standards and Forest Plan standards and objectives. The data collected will document land management effects on beneficial uses of the stream. Results may suggest the need to modify BMPs, Forest Plan standards, or State water quality standards, and may result in an amendment to the Forest Plan. This monitoring will satisfy the nonpoint source feedback loop policy of both the Forest Service and State of Idaho.

Validation

Validation monitoring evaluates whether coefficients, models, and Forest Plan standards are valid to meet policy, laws, and regulations. Validation monitoring requires a long-term commitment and intensive data collection at established permanent stations.

Each monitoring activity will include the following: 1) Type of monitoring; 2) Project name; 3) Site

location; 4) Objectives; 5) Parameters; 6) Frequency; 7) Duration; 8) Methodology; 9) Data Storage; 10) Reporting; 11) Personnel needed; and 12) Responsible individual(s).

Stream Segments of Concern

Extensive monitoring is currently being done in the Stream Segments of Concern (SSOC). The following table summarizes fiscal year 1995 soil and water monitoring in each SSOC.

Monitoring Activities in Stream Segments of Concern

Segment Number	Stream Name	District	Page Reference
1150	Potlatch River	Palouse	10-12,17,26
1157	E.F. Potlatch River	Palouse	10-12
1174	Lolo Creek	Pierce	10-12,17,20,24
1175	Eldorado Creek	Pierce	10-12,17,24
1178	Yoosa Creek	Pierce	10-12,24
1180.05	Camp Creek	Pierce	10-12,24
1189	Elk Creek	Palouse	10-12,20,26,35
1211	Skull Creek	North Fork	10-12
1213	Quartz Creek	North Fork	10-12,17,26
1217	Weitas Creek	Pierce	6,10-12,25,34
1229	Gravey Creek	Powell	10-12
1232	Meadow Creek	North Fork	27
1242	Fish Creek	Lochsa	17,29
1249	Walton Creek	Powell	10,12,18,22,31

Segment Number	Stream Name	District	Page Reference
1250	White Sand Creek	Powell	8,10-12,15,30-31
1255	Crooked Fork Creek	Powell	8,10-12,15,30
1256	Brushy Fork Creek	Powell	10-12,30
1256.01	Spruce Creek	Powell	10-12,30
1257	Boulder Creek	Powell	10-12

On-Site Monitoring

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-Wide Precipitation Gages

District	Station	Township	Range	Section	Gage Type	Period of Record
North Fork	Beaver	39N	5E	23	1	1969-Current
North Fork	Cayuse	38N	11E	3	2	1967-Present
North Fork	Doris ¹	37N	9E	6	3	1966-Present
Lochsa	Walde	34N	7E	31	2	1966-Present

¹ The Doris precipitation gage is in the Weitas Creek watershed, a Stream Segment of Concern

Gage Type: 1 = 100" Sacramento, Non-Recording Gage
 2 = 200" Sacramento, Non-Recording Gage
 3 = Standpipe

Objectives: To update and modify the Forest's precipitation maps.

Parameters: Annual precipitation.

Frequency: Annually.

Duration: Indefinitely.

Methodology: Gages will be drained and the total catch measured at the end of the water year (September 30). The gages will be recharged with oil and anti-freeze for the next year.

Data Storage: S.O. Watershed files.

Report: As needed.

Cost: \$500 Annually.

Personnel Needed: One or two.

Responsible Individual: Dick Jones

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-Wide Snow Survey

District	Station	Township	Range	Section	Gage Type
Pierce	Pierce R.S.	36N	5E	2	Snow Course
Powell	Crooked Fork ¹	37N	14E	27	Snow Course
Powell	Savage Pass ²	36N	15E	18	SNOTEL, Precipitation
Powell	Lolo Pass ¹	38N	15E	11	SNOTEL, Precipitation

¹ The Crooked Fork and Lolo Pass sites are in the Crooked Fork watershed, a Stream Segment of Concern.

² The Savage Pass site is in the White Sand watershed, a Stream Segment of Concern.

Objectives: Cooperative snow survey with the Soil Conservation Service. The survey determines the yearly snowpack for water availability in the Columbia Basin watershed for hydropower, irrigation, and recreation users.

Parameters: Snow depth, water content, snowpack density, minimum and maximum temperatures, and annual precipitation.

Frequency: As found in the *Idaho Snow Survey Measurement Schedule*.

Duration: Indefinitely.

Methodology: Standard SCS snow survey techniques.

Data Storage: SCS and District files.

Report: The SCS develops monthly and annual reports of all snow courses in Idaho. Dick Jones develops a report every two weeks of current snowpack water content.

Cost: \$2,000 Annually.

Personnel Needed: Clare Brick, Pierce R.D. and Jed Simon, Powell R.D. and one other person from each District.

Responsible Individual: Clare Brick, Pierce R.D. and Jed Simon, Powell R.D.

Monitoring Project Summary Sheet

Type of Monitoring:	Implementation
District:	All Districts
Project Name:	Timber Sale Contract and Idaho Forest Practices Act Compliance Monitoring.
Site Location:	All ongoing timber sales.
Objectives:	Determine compliance with timber sale contract specifications and Idaho Forest Practices Act Rules and Regulations. Correct non-compliance to eliminate potential water quality problems.
Parameters:	Streamside protection, culverts, grass seeding, erosion control on roads, skid trails, and landings.
Frequency:	Continuously. As sales are administered.
Duration:	Indefinitely.
Methodology:	Visual inspections by sale administrators.
Data Storage:	District timber sale package.
Report:	In timber sale package.
Personnel Needed:	All sale administrators.
Responsible Individual:	District Rangers.

Monitoring Project Summary Sheet

Type of Monitoring: Implementation and Effectiveness.

District: All Districts

Project Name: Timber Sale Unit BMP Audit.

Site Location: Selected timber sales.

Objectives: Determine BMP implementation and effectiveness in preventing sediment delivery to Class I and Class II streams. Determine if BMPs meet or exceed the Idaho FPA Rules and Regulations.

Parameters: Inspection of Idaho FPA Rules and Regulations implementation and effectiveness in timber sale units, including timber harvest, site preparation, and skid trail location and design.

Frequency: One site visit of a timber sale unit during or after logging, or during or after site preparation.

Duration: One site visit.

Methodology: A visual inspection of 10% of all timber sale units by an S.O. and District interdisciplinary team. Representatives from IDL and DEQ will be invited to the audit.

Data Storage: S.O. Watershed files.

Report: Dick Jones will write an annual summary for the *Forest Plan Monitoring Results Report*.

Cost: \$1500

Personnel Needed: Dick Jones with assistance from S.O. and District representatives.

Responsible Individual: Dick Jones.

Monitoring Project Summary Sheet

Type of Monitoring: Implementation and Effectiveness.

District: All Districts

Project Name: Forest-wide Road BMP Monitoring.

Site Location: All roads constructed and major reconstruction, including cost-share roads accepted from 1992 to 1994.

Objectives: Evaluate BMP implementation and effectiveness of prescribed erosion control measures on various soil types.

Parameters: Photos. Erosion control measures.

Frequency: One site visit of roads constructed in the current and preceding year.

Duration: Two years.

Methodology: A visual inspection of individual road segments by a District and S.O. interdisciplinary team.

Data Storage: S.O. Ecologist files.

Report: Yearly summary report.

Cost: \$1,000

Personnel Needed: Jim Mital and Anne Connor, with assistance from S.O. and District representatives.

Responsible Individual: Jim Mital.

Monitoring Project Summary Sheet

Type of Monitoring: Baseline, Implementation, and Effectiveness.

District: North Fork and Powell.

Project Name: Forest-wide Soil Compaction and Displacement Monitoring.

Site Location: Units on a variety of landtypes and photo interpretation sites.

Objectives: To monitor impacts of past management and natural (i.e. wildfires) activities on physical properties of the soil resource. Establish baseline conditions on unentered areas.

Parameters: Soil compaction, displacement, burn damage.

Frequency: One site visit.

Duration: Five to ten years in the future on some units.

Methodology: On-the-ground transect surveys.

Data Storage: S.O. Ecologist files. ECOPAC Database.

Report: Yearly summary report.

Cost: \$8000

Personnel Needed: Jim Mital and Steve Jamsa, with assistance from S.O. and District representatives.

Responsible Individual: Jim Mital.

Instream Monitoring

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-Wide Stream Gages

Stream	District	Township	Range	Section	Record
N.F. Clearwater (At Aquarius Bridge) ¹	North Fork	40N	7E	6	1967-Current
Isabella Creek	North Fork	41N	7E	31	1980-Current
Lochsa River ¹	Lochsa	33N	7E	33	1929-Current
Papoose Creek	Powell	37N	13E	36	1996
Crooked Fork ²	Powell	37N	14E	34	1980-Current
White Sand ²	Powell	37N	14E	34	1980-Current

¹ U.S.G.S. Station.

² Stream Segment of Concern.

Objectives: These stations compliment the Forest's baseline water quality network. Information is used for predictive purposes.

Parameters: Streamflow and stage. Stations are equipped with continuous read-out Stevens water level recorders.

Frequency: Isabella, Papoose, Crooked Fork, and White Sand Creek gages are operated continuously from April through October. The North Fork and Lochsa River gages are operated continuously, year-long.

Duration: Indefinitely.

Methodology: U.S.G.S. standard methods and techniques for measuring streamflow and maintaining stream gaging stations.

Data Storage: Forest Data General computer system.

Report: As needed.

Cost: \$2000 Annually.

Personnel Needed: Brooks Beagle and District personnel for data collection. Gayle Howard and Debbie Clark for data storage and reduction.

Responsible Individual: Brooks Beagle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-wide Sediment Discharge Stations

Stream	District	Beneficial Use ²	Township	Range	Section	Record
Lolo Creek (Mouth) ¹	Pierce	Steelhead	35N	2E	4	1991-Current
Eldorado Creek (Below Linda) ¹	Pierce	Steelhead High Fish	34N	6E	21	1991-Current
Palouse River (Above L. Sand)	Palouse	Brook Trout Minimum Viable	42N	2W	31	1981-Current
Potlatch River (Below L. Boulder) ¹	Palouse	Rainbow Minimum Viable	40N	1W	33	1995
Quartz Creek ¹	North Fork	Cutthroat High Fish	40N	8E	16	1981-Current
Fern Creek ³	North Fork	Cutthroat High Fish	41N	7E	30	1990-Current
Pete King Creek	Lochsa	Steelhead High Fish	33N	7E	28	1976-Current
Canyon Creek	Lochsa	Steelhead Figh Fish	33N	7E	11	1992-Current
Deadman Creek	Lochsa	Steelhead High Fish	33N	8E	6	1980-Current
Fish Creek ¹	Lochsa	Steelhead No Effect	35N	9E	33	1992-Current
Squaw Creek (Abv Doe)	Powell	Chinook No Effect	37N	13E	32	1996
Doe Creek ⁴	Powell	Steelhead High Fish	37N	13E	32	1996
W. F. Swamp Creek	Powell	Cutthroat High Fish	37N	13E	19	1996

Stream	District	Beneficial Use ²	Township	Range	Section	Record
W F Papoose Creek ³	Powell	Steelhead High Fish	37N	13E	24	1996
E.F. Papoose Creek ³	Powell	Steelhead High Fish	37N	13E	24	1996
Walton Creek ^{1,3}	Powell	Steelhead High Fish	37N	14E	34	1992-Current

¹ Stream Segment of Concern

² Beneficial Uses are found in the Forest Plan, Page K-4.

³ Discharge is related to a Forest-Wide stream gage.

⁴ Discharge is related to the Swamp above Doe gage

Objectives: Provide long-term sediment/discharge data in managed watersheds. Determine the effectiveness of management practices.

Parameters: Stream discharge, suspended sediment, and sediment loading.

Frequency: Stevens water level recorders and ISCOs operate continuously from March through October. Discharge measurements will be taken a minimum of six times per year, with concentration during the high flow period and one measurement during low flow at the end of the season.

Duration: Indefinitely.

Methodology: Continuous recording gage and ISCO automatic water sampler. U.S.G.S. standard methods and techniques for measuring suspended sediment, streamflow, and maintaining stream gaging stations. A depth integrated suspended sediment sample will be collected every 28 days, or when the ISCO bottles are changed.

Data Storage: Forest Data General computer system.

Report: A report is done on data collected from each station every five to ten years. The information is included in the *Forest Plan Monitoring Results Report*.

Cost: \$10,000 Annually.

Personnel Needed: Brooks Beagle, Gayle Howard, Debbie Clark with assistance from District biological technicians for data collection. Gayle Howard and Debbie Clark

for data storage and reduction.

Responsible Individual: Brooks Beagle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Baseline and Validation

Project Name: Forest-wide Sediment Discharge and Bedload Stations

Stream	District	Beneficial Use ²	Township	Range	Section	Record
Lolo Creek (At Section 6) ¹	Pierce	Steelhead High Fish	34N	6E	6	1980-Current
Elk Creek ¹	Palouse	Brook Trout High Fish	40N	2E	23	1981-Current

¹ Stream Segment of Concern

² Beneficial Uses are found in the Forest Plan, Page K-4.

Objectives: Provide long-term suspended and bedload sediment/discharge data in disturbed watersheds. At Lolo Creek, determine the effectiveness of management practices and the recovery from past activities. At Elk Creek, determine the rate of channel recovery from a debris torrent.

Parameters: Stream discharge, suspended and bedload sediment, and sediment loading.

Frequency: Stevens water level recorders and ISCOs operate continuously from March through October. Discharge measurements will be taken a minimum of six times per year, with concentration during the high flow period and one measurement during low flow at the end of the season. Bedload samples will be collected 20 times per year, with concentration on the rising limb of the hydrograph and at peak flow.

Duration: Lolo Creek and Elk Creek - indefinitely.

Methodology: Continuous recording gage and ISCO automatic water sampler. U.S.G.S. standard methods and techniques for measuring suspended and bedload sediment, streamflow, and maintaining stream gaging stations. A depth integrated suspended sediment sample will be collected every 28 days, or when the ISCO bottles are changed.

Data Storage: Forest Data General computer system.

Report: A report is done on data collected from each station every five to ten years. The information is included in the *Forest Plan Monitoring Results Report*.

Cost: \$7,000 Annually.

Personnel Needed: Brooks Beagle with assistance from District biological technicians for data collection. Gayle Howard and Debbie Clark for data storage and reduction.

Responsible Individual: Brooks Beagle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Effectiveness

Project Name: Forest-wide Project Monitoring. Continuous Sediment Discharge Stations

Stream	District	Beneficial Use ²	Record	Activity
Salmon Creek (Lower)	North Fork	Cutthroat High Fish	1986-Current	Road Construction and Lower Salmon Timber Sale
Salmon Creek (Upper)	North Fork	Cutthroat High Fish	1986-Current	Control Above Activities
Pete King Creek	Lochsa	Steelhead High Fish	1994-Current	Study the Effects of an Instream Sediment Trap on Suspended Sediment
Walton Creek ¹	Powell	Steelhead High Fish	1993-Current	Monitor Suspended Sediment From Roads Produced By Summer Rain Storms

¹ Stream Segment of Concern

² Beneficial Uses are found in the Forest Plan, Page K-4.

Objectives: Determine the effectiveness of BMPs and management practices in preventing sediment delivery to streams. Determine the recovery rates of watersheds that have been impacted in the past.

Parameters: Stream discharge, suspended sediment, and sediment loading.

Frequency: Stevens water level recorders and ISCOs operate continuously from March through October, except for Walton Creek Storm that operates From June to September. Discharge measurements will be taken a minimum of six times per year, with concentration during the high flow period and one measurement during low flow at the end of the season.

Duration: Three to Ten Years.

Methodology: Continuous recording gage and ISCO automatic water sampler. U.S.G.S. standard methods and techniques for measuring suspended sediment, streamflow, and maintaining stream gaging stations. A depth integrated suspended sediment sample will be collected every 28 days, or when the

ISCO bottles are changed.

Data Storage: Forest Data General computer system.

Report: A report is done on data collected from each station at the end of the sampling period. The information is included in the *Forest Plan Monitoring Results Report*.

Cost: \$5000 Annually.

Personnel Needed: Brooks Beagle, Gayle Howard, Debbie Clark with assistance from District biological technicians for data collection. Gayle Howard and Debbie Clark for data storage and reduction.

Responsible Individual: Brooks Beagle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Effectiveness

Project Name: Forest-wide Water Temperature Monitoring

Stream	District	Beneficial Use ²	Record	Activity
Lolo Creek ¹	Pierce	Steelhead High Fish	1989-1995	Baseline
Dutchman Creek ¹	Pierce	Steelhead High Fish	1995	Timber Sales
Yoosa Creek ¹	Pierce	Steelhead High Fish	1991-1995	Timber Sales
Knoll Creek ¹	Pierce	Steelhead High Fish	1995	Timber Sales
Yakus Creek ¹	Pierce	Cutthroat High Fish	1994-1995	Timber Sales
Camp Creek ¹	Pierce	Steelhead High Fish	1990-1995	Timber Sales
Dan Lee Creek ¹	Pierce		1994-1995	Timber Sales
Musselshell Creek	Pierce	Steelhead High Fish	1990-1995	Timber Sales
Gold Creek	Pierce	Cutthroat Moderate Fish	1995	Timber Sales
Eldorado Creek ¹	Pierce	Steelhead High Fish	1989-1995	Baseline
Lunch Creek ¹	Pierce	Steelhead High Fish	1990-1995	Timber Sales
Cedar Creek ¹	Pierce	Cutthroat Moderate Fish	1992-1995	Timber Sales
Six Bit Creek ¹	Pierce	Steelhead High Fish	1990-1995	Timber Sales
Trout Creek ¹	Pierce	Steelhead High Fish	1990-1995	Timber Sales
Fan Creek ¹	Pierce	Steelhead High Fish	1990-1995	Timber Sales

Stream	District	Beneficial Use ²	Record	Activity
Weitas Creek ¹	Pierce	Cutthroat No Effect	1994-1995	Baseline
Hemlock Creek ¹	Pierce	Cutthroat High Fish	1994-1995	Baseline
Larch Creek ¹	Pierce	Cutthroat High Fish	1994-1995	Baseline
Little Weitas Creek ¹	Pierce	Cutthroat High Fish	1994-1995	Baseline
Middle Creek ¹	Pierce	Cutthroat Moderate Fish	1994-1995	Timber Sales
Orogrande Creek	Pierce	Cutthroat Low Fish	1994-1995	Baseline
Fuzzy Creek	Pierce	Cutthroat Low Fish	1995	Timber Sales
Pine Creek	Pierce	Cutthroat Low Fish	1994-1995	Timber Sales
Hook Creek	Pierce		1995	Timber Sales
Elk Creek	Pierce		1995	Timber Sales
Grand Creek	Pierce		1995	Timber Sales
Cache Creek	Pierce		1995	Timber Sales
French Creek	Pierce	Cutthroat Low Fish	1994-1995	Timber Sales
Sylvan Creek	Pierce	Cutthroat High Fish	1991-1995	Timber Sales
Hem Creek	Pierce	Cutthroat High Fish	1994-1995	Timber Sales
Palouse River (Station)	Palouse	Brook Trout Minimum Viable	1995	Timber Sales Grazing
Meadow Creek	Palouse	Brook Trout Minimum Viable	1995	Timber Sales Grazing

Stream	District	Beneficial Use ²	Record	Activity
E.F. Meadow Creek	Palouse	Brook Trout Minimum Viable	1994-1995	Timber Sales Grazing
Palouse River (Abv N F)	Palouse	Brook Trout Minimum Viable	1995	Timber Sales Grazing
Potlatch River ¹	Palouse	Rainbow Minimum Viable	1993-1995	Timber Sales Grazing
Potlatch River (Abv W F) ¹	Palouse	Rainbow Minimum Viable	1995	Timber Sales Grazing
W.F. Potlatch River	Palouse	Rainbow Minimum Viable	1995	Timber Sales Grazing
Elk Creek Station ¹	Palouse	Brook Trout High Fish	1994-1995	Timber Sales Grazing
Elk Creek Upper Basin ¹	Palouse	Brook Trout High Fish	1994-1995	Timber Sales Grazing
Elk Creek (Abv Reservoir) ¹	Palouse	Brook Trout Minimum Viable	1994-1995	Timber Sales Grazing
Elk Creek (Blw Resivor) ¹	Palouse	Brook Trout Minimum Viable	1994-1995	Timber Sales Grazing
Quartz Creek ¹	North Fork	Cutthroat High Fish	1992-1995	Timber Sales
Cougar Creek ¹	North Fork	Cutthroat Moderate Fish	1994-1995	Timber Sales
Grizzly Creek ¹	North Fork	Cutthroat Moderate Fish	1994-1995	Timber Sales
Game Creek	North Fork		1995	Timber Sales
Lick Creek	North Fork		1995	Timber Sales

Stream	District	Beneficial Use ²	Record	Activity
Coyote Creek	North Fork		1995	Timber Sales
Comet Creek	North Fork	Cutthroat High Fish	1995	Timber Sales
North Fork of the Clearwater River @ Cedars	North Fork	Cutthroat No Effect	1995	Baseline
Wrangle Creek	North Fork		1995	Baseline
Birch Creek	North Fork		1995	Baseline
Meadow Creek ¹	North Fork	Cutthroat High Fish	1994-1995	Baseline
Vanderbilt Creek	North Fork	Cutthroat High Fish	1994-1995	Baseline
Placer Creek	North Fork		1994-1995	Baseline
Bostonian Creek	North Fork	Cutthroat High Fish	1994-1995	Baseline
Niagara Creek	North Fork	Cutthroat High Fish	1994-1995	Baseline
Boundary Creek	North Fork	Cutthroat High Fish	1994-1995	Baseline
Long Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales
Rawhide Creek	North Fork		1994-1995	Timber Sales
Slate Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales
Short Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales
Lake Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales

Stream	District	Beneficial Use ²	Record	Activity
Moose Creek	North Fork	Cutthroat High Fish	1994-1995	Mining, Timber Sales
Osier Creek	North Fork	Cutthroat High Fish	1994-1995	Mining, Timber Sales
China Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales
Laundry Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales
Deadwood Creek	North Fork	Cutthroat High Fish	1994-1995	Mining, Timber Sales
Independence Creek	North Fork	Moderate Fish Proposed	1994-1995	Mining, Timber Sales
Sneak Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales
Sheep Creek	North Fork	Cutthroat High Fish	1995	Timber Sales
Isabella Creek	North Fork	Cutthroat High Fish	1994-1995	Timber Sales
Black	North Fork	Cutthroat Moderate Fish	1994-1995	Timber Sales
Fern Creek	North Fork	Cutthroat High Fish	1995	Timber Sales
Leuty Creek	North Fork		1995	Timber Sales
Sourdough Creek	North Fork	Cutthroat Moderate Fish	1994-1995	Timber Sales
Len Creek	North Fork		1994-1995	Timber Sales
Lochsa River	Lochsa	No Effect	1993-1995	Baseline
Pete King Creek	Lochsa	Steelhead High Fish	1990-1995	Timber Sales
W.F. Pete King Creek	Lochsa	Steelhead High Fish	1991-1995	Timber Sales

Stream	District	Beneficial Use²	Record	Activity
Polar Creek	Lochsa	Steelhead High Fish	1992-1995	Timber Sales
Walde Creek	Lochsa	Steelhead High Fish	1991-1995	Timber Sales
Placer Creek	Lochsa	Steelhead High Fish	1994-1995	Timber Sales
Nut Creek	Lochsa	Steelhead High Fish	1992-1995	Timber Sale
Canyon Creek	Lochsa	Steelhead High Fish	1991-1995	Timber Sales
S.F. Canyon Creek	Lochsa	Steelhead High Fish	1992-1995	Timber Sales
Mystery Creek	Lochsa	Cutthroat High Fish	1991-1995	Timber Sales
Deadman Creek	Lochsa	Steelhead High Fish	1990-1995	Timber Sales
W.F. Deadman Creek	Lochsa	Steelhead High Fish	1992-1995	Timber Sales
Fish Creek ¹	Lochsa	Steelhead No Effect	1993-1995	Baseline
Hungry Creek	Lochsa	Steelhead No Effect	1990-1995	Baseline
Sherman Creek	Lochsa	Steelhead High Fish	1995	Baseline
Bald Mountain Creek	Lochsa	Cutthroat High Fish	1995	Baseline
Boulder Creek	Lochsa	No Effect	1995	Baseline
Weir Creek	Powell	Steelhead High Fish	1995	Baseline
E F Weir Creek	Powell	Steelhead High Fish	1995	Baseline
W F Weir Creek	Powell	Steelhead High Fish	1995	Baseline

Stream	District	Beneficial Use ²	Record	Activity
Post Office Creek	Powell	Steelhead High Fish	1995	Timber Sales
E F Post Office	Powell	Steelhead High Fish	1995	Timber Sales
W F Post Office	Powell	Steelhead High Fish	1995	Timber Sales
Squaw Creek	Powell	Chinook High Fish	1990-1995	Timber Sales
W.F. Squaw Creek	Powell	Cutthroat High Fish	1994-1995	Timber Sales
W.F. Squaw (Abv Spring)	Powell	Cutthroat High Fish	1995	Timber Sales
Spring Creek	Powell	Cutthroat High Fish	1994-1995	Timber Sales
E.F. Squaw Creek	Powell	Cutthroat High Fish	1994-1995	Timber Sales
Doe Creek	Powell	Steelhead High Fish	1994-1995	Timber Sales
Papoose Creek	Powell	Steelhead High Fish	1991-1995	Timber Sales
EF Papoose Creek	Powell	Steelhead High Fish	1995	Timber Sales
WF Papoose Creek	Powell	Steelhead High Fish	1995	Timber Sales
Parachute Creek	Powell	Steelhead High Fish	1995	Timber Sales
Crooked Fork Creek ¹	Powell	Chinook No Effect	1990-1995	Timber Sales
Shotgun Creek ¹	Powell	Steelhead High Fish	1995	Timber Sales
Brushy Fork (Lower) ¹	Powell	Chinook No Effect	1990-1995	Timber Sales
Brushy Fork (Mid) ¹	Powell	Chinook No Effect	1995	Timber Sales

Stream	District	Beneficial Use ²	Record	Activity
S.F. Spruce Creek ¹	Powell	Steelhead High Fish	1994-1995	Timber Sales
White Sand Creek ¹	Powell	Chinook No Effect	1990-1995	Timber Sales
White Sand Creek (Upper) ¹	Powell	Steelhead No Effect	1995	Timber Sales
Cabin Creek ¹	Powell	Cutthroat High Fish	1994-1995	Timber Sales
Storm Creek ¹	Powell	Cutthroat No Effect	1994-1995	Baseline
Maud Creek ¹	Powell	Cutthroat No Effect	1994-1995	Baseline
Dan Creek ¹	Powell	Chinook No Effect	1994-1995	Baseline
Fern Creek ¹	Powell	Chinook No Effect	1994-1995	Baseline
Colt Creek ¹	Powell	Steelhead High Fish	1994-1995	Timber Sales
Savage Creek ¹	Powell	Cutthroat High Fish	1994-1995	Timber Sales
Big Flat ¹	Powell	No Effect	1994-1995	Baseline
Big Sand ¹	Powell	Cutthroat No Effect	1994-1995	Baseline
Walton Creek ¹	Powell	Steelhead High Fish	1991-1995	Timber Sales
Warm Springs Creek	Powell	Steelhead High Fish	1995	Baseline
Cooperation Creek	Powell	Cutthroat High Fish	1995	Baseline
Wind Lake Creek	Powell	Steelhead High Fish	1995	Baseline
Cayuse Creek	Powell	Cutthroat High Fish	1994-1995	Baseline

Stream	District	Beneficial Use ²	Record	Activity
Silver Creek	Powell	Cutthroat High Fish	1994-1995	Baseline

¹ Stream Segment of Concern

² Beneficial Uses are found in the Forest Plan, Page K-4.

Objectives: Determine the effectiveness of BMPs and management practices in preventing stream temperature increases.

Parameters: Water temperature.

Frequency: Continuous, June through September.

Duration: One to five Years.

Methodology: Continuous recording thermographs. The Forest uses Ryan TempMentor, Ryan Modal J, and Hobo thermographs that record stream water temperature.

Data Storage: District files.

Report: A report is done by the District Biologist and submitted to the Forest Fisheries Biologist at the end of the sampling period. Some of these reports are selected for inclusion in the *Forest Plan Monitoring Results Report*.

Cost: \$12,000 Annually.

Personnel Needed: District Biologic Technicians.

Responsible Individual: Dave Schoen for technical assistance. Each District Biologist is responsible for his/her data maintenance and analysis.

Monitoring Project Summary Sheet

Type of Monitoring:

Effectiveness

Project Name:

Forest-wide Riparian Effectiveness Monitoring

Objectives:

Determine the effectiveness of shade on stream water temperature in various riparian zones.

Parameters:

Stream water temperature.

Frequency:

Continuous, June through September.

Duration:

One to five Years.

Methodology:

Continuous recording thermographs. The Forest will use Hobo thermographs for this monitoring. Generally, monitoring will occur above and below study riparian areas. Riparian areas will be stratified according to fisheries habitat, aspect, elevation, cover, or other parameters.

Data Storage:

District files.

Report:

A yearly summary report will be done by Bryan Stotts and submitted to the Forest Fisheries Biologist. This report will be included in the *Forest Plan Monitoring Results Report*.

Cost:

\$5,000 Annually.

Personnel Needed:

Bryan Stotts and District Biologic Technicians.

Responsible Individual:

Bryan Stotts for overall project coordination. Each District Biologist is responsible for his/her data collection and file maintenance.

Monitoring Project Summary Sheet

Type of Monitoring: Effectiveness

Project Name: Forest-wide Stream Channel Morphology

Stream	District	Beneficial Use ²	Schedule	Activity
Weitas Creek ¹	Pierce	Cutthroat No Effect	1995, 2000	Baseline
Hemlock ¹	Pierce	Cutthroat High Fish	1995, 2000	Baseline
Pine Creek	Pierce	Cutthroat Low Fish	1995, 2000	Timber Sales
French Creek	Pierce	Cutthroat Low Fish	1995, 2000	Timber Sales
Tamarack Creek	Pierce	Cutthroat High Fish	1995, 2000	Timber Sales
E F Meadow Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing
Mannering Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing
Wepah Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing
Piah Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing
Strychnine Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing
Poorman Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing
Torpid Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing

Stream	District	Beneficial Use ²	Schedule	Activity
Elk Creek (Station) ¹	Palouse	Brook Trout High Fish	1993-1996	Debris Torrent
Elk Creek Slide Impact Zone ¹	Palouse	Brook Trout High Fish	1993-1996	Debris Torrent
Elk Creek (Upper Basin) ¹	Palouse	Brook Trout High Fish	1995, 1998	Timber Sales Grazing
Cloverleaf Creek	Palouse	Brook Trout Minimum Viable	1995, 1998	Timber Sales Grazing
Moose Creek	North Fork	Cutthroat High Fish	1995, 2000	Timber Sales, Mining
Squaw Creek (Abv Doe) ³	Powell	Chinook High Fish	1995-1998	Timber Sales
Doe Creek ³	Powell	Steelhead High Fish	1995-1998	Timber Sales
W F Squaw Creek ³	Powell	Cutthroat High Fish	1995-1998	Timber Sales
Papoose Creek ³	Powell	Steelhead High Fish	1995-1998	Timber Sales
W F Papoose Creek ³	Powell	Steelhead High Fish	1995-1998	Timber Sales
E F Papoose Creek ³	Powell	Steelhead High Fish	1995-1998	Timber Sales

¹ Stream Segment of Concern

² Beneficial Uses are found in the Forest Plan, Page K-4.

³ Powell Sites - Stream Channel Morphology monitoring will consist of gradient, cross section, Wolman pebble count, bankfull measurement, and channel type in a run section of stream to establish new sediment - discharge monitoring sites.

Objectives: Determine the effectiveness of BMPs and management practices in preventing harmful changes to stream channel geomorphological characteristics, including stream width, substrate composition, and gradient.

Parameters: Particle size distribution, channel cross section, and gradient of the water surface.

- Frequency:** One survey every three to five years.
- Duration:** Before activities to five years after activities.
- Methodology:** Standard procedures found in *Riffle Stability Index, a procedure to evaluate stream reach and watershed equilibrium*, Gary Kappesser, Forest Hydrologist, Idaho Panhandle National Forests. The preferred method is the 30 particle count procedure. This method will be used when point or mid-channel bars are present. If point or mid-channel bars are not present, the stream channel survey procedure will be used.
- Data Storage:** S.O. Watershed files.
- Report:** A report will be done after the second measurement to determine trend. Some reports are selected for inclusion in the *Forest Plan Monitoring Results Report*.
- Cost:** \$3,000 Annually.
- Personnel Needed:** S.O. and District Hydrologic and Biologic Technicians. A minimum of two people are needed for each measurement.
- Responsible Individual:** Gayle Howard for data collection and maintenance.