FIRE

GOAL

Prevent, suppress and manage fire commensurate with resource values to be protected, while recognizing the role of fire in the ecological processes.

Implement the five key points of the National Fire Plan (NFP), which are: firefighting, preparedness, restoration and rehabilitation of burned areas, hazardous fuels treatment, community assistance and accountability.

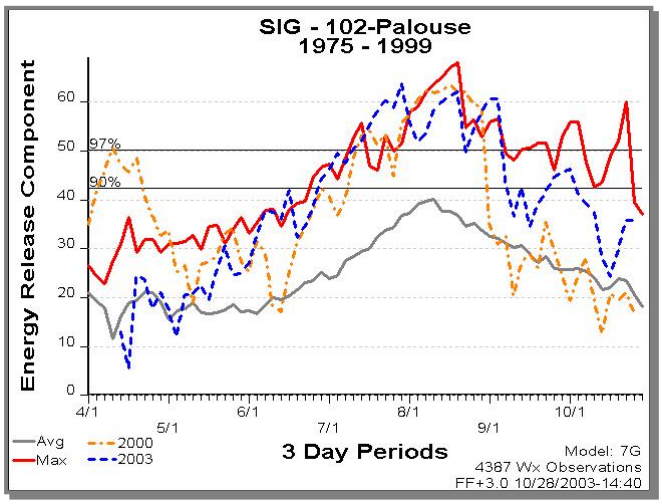
STRATEGY

- Analyze and display organizational needs using the National Fire Management Analysis System (NFMAS) to determine the most cost efficient fire management organization.
- Continue to stress **SAFETY** as the first priority in all fire management activities with special emphasis on the aviation program, firefighting and recurrent training in Standards for Survival.
- Continue the use of appropriate management responses under Federal Wildland Fire Policy to meet fire management objectives.
- Integrate Ecosystem Management concepts into fire management programs. Look at ways to utilize and incorporate fire treatment into sustaining healthy ecosystems, concentrating on restoration of fire adapted ecosystems
- Continue to use fire to accomplish management objectives for hazardous fuel reduction, site preparation, wildlife habitat improvement and ecosystem management through prescribed fire and wildland fire use programs. Continue wildland fire use implementation consistent with the Forest Plan and National Fire Policy.
- Continue cooperation with other fire protection agencies; evaluate fire protection boundaries to promote economic and efficient fire suppression. Work with communities to increase fire protection capability and support expansion of economic diversity.
- Provide a cadre of specialists with the knowledge and experience to accomplish prescribed fire programs and participate as members of the wildland fire Incident Command System.
- Ensure sufficient funds are collected from timber sales to abate activity created fuel hazards. Manage the trust fund account to ensure all work is completed.
- Continue to support and be involved in achieving the goals of habitat improvement and the restoration of elk under the Clearwater Elk Initiative.
- Continue to implement the North Idaho Smoke Management Airshed guidelines and coordinate prescribed burning and wildfire smoke impacts with this group and adjacent cooperators.
- Implement Fire and Aviation Management activities through the Fire Management Plan (FMP) including preparedness staffing, qualifications, initial action, large fire suppression, wildland fire use and use of Minimum Impact Suppression Tactics (MIST) for lands under the protection of the Clearwater National Forest.

MONITORING ACTION

The Fire staff will annually prepare and implement a FMP that will provide specific direction for accomplishing national fire management policy and fire management objectives outlined in the Forest Plan. The primary elements used to monitor the program are: fire starts, acreage burned, wildland fire use events and

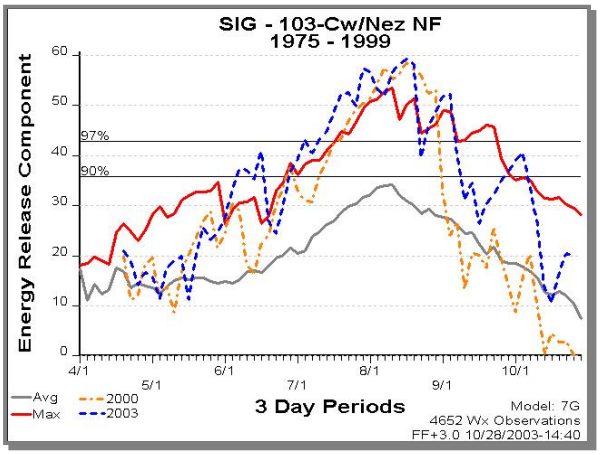
acreage burned, hazardous fuels treatment acres, acres burned in riparian areas, and acres affected by high intensity fire, hours flown and aviation mission type.



ACCOMPLISHMENTS / FINDINGS

The summer of 2003 saw more acres burned by wildland fire on the Clearwater National Forest since 1921.

El Nino conditions in the Pacific Ocean, which have been responsible for four years of drought conditions in the Northern Rockies, diminished during the winter of 2002-2003. A winter that began quite mild with limited moisture and warm temperatures began to change in January when winter did arrive. During the ensuing 4-month period snow pack and moisture received approached normal values; however the near normal precipitation did little to replenish a four-year deficit. Burning windows were limited during April and May and only a part of the spring burning target could be accomplished. Widespread moisture generally ceased in early June and fire danger developed rapidly as a strong ridge of high pressure developed over the interior west in early July that brought widespread record warmth and record dryness that negated the beneficial effects of past spring rains. As expected, ERC values climbed steadily and exceeded recorded 30-year maximum values through July and most of August. The graphs display the fire danger for the 2003 season; average and maximum lines use 1975-1999 data while the 2000 and 2003 lines indicate the extreme conditions reached.



The hot dry summer set the stage for large and long duration fire events that began in early July. The Clearwater Forest was only brushed by several large storms that hit Western Montana hard in mid- to late July. The Forest did receive a full share of lightning ignitions in early August, with the majority occurring on the Powell District. The North Fork and areas protected by the Idaho Department of Lands escaped the brunt of these storms and in general had a below average season for number of fires.

The Clearwater and Nez Perce National Forests utilized 14 incident management teams (IMTs) in 2003 to manage large fire events. A Fire Use Management Team was stationed at Powell to deal with a full range of management options for fires on the Powell, North Fork, and Lochsa Districts. For the first time we had an Area Command Team stationed in Grangeville to coordinate the efforts of the various IMTs. We made extensive use of resources assigned to the various large incidents on the Zone in our suppression efforts. Our Fire Management Officers agree that the Forests would have experienced more large fires if crews and helicopters had not been readily available.

Expanded dispatch was staffed in Grangeville for 57 consecutive days to support large fires.

Precipitation the first week of September brought a dip in ERC's to below the 90th percentile for the first time in two months only to see a rebound to record setting levels again by the first of October. The rebound was short lived as some moisture associated with shorter days and good humidity recovery limited further fire activity.

PRE-SUPPRESSION / PREPAREDNESS

The Forest continued implementation of the Federal Wildland and Prescribed Fire Management Policy. This policy was adopted nationally in 1998 and incorporates nine guiding principles and provides consistent fire management direction for all federal agencies.

Funding to protect Forest resources from fire is based on the National Fire Management Analysis System, an analysis tool designed to determine the most efficient level of fire protection budget. This analysis is based on fire history, fire weather and past organizational levels. It then establishes the most cost efficient mix of personnel, equipment and budget needed to provide firefighting resources to met land management objectives. The program was last certified in 1997 and the most cost efficient organization was determined. Costs to produce MEL are updated annually through outyear budget submissions.

- The Forest's budget for FY03 was $3,404,000.
- The Forest received about 95 percent of the most efficient level of funding, slightly up from the $2,893,700 received in FY02.
- The Forest staffed a 10-person helitack crew and exclusive use helicopter at Musselshell Work Center in 2003.
- Idaho Department of Lands positioned 2 Single Engine Air Tankers in Grangeville this year which saw wide spread service on the Forest.
- The Clearwater/Nez Perce Fire Zone met with fire cooperators on a number of issues and programs including the development of county disaster plans, community protection, hazardous fuels treatment around communities, and economic development strategies.

WILDFIRE DETECTION AND STATISTICAL CAUSE

Wildfire detection on the Clearwater is primarily provided by our staffed Lookouts and fixed wing detection flights.

Staffed Lookouts during the 2003 fire season included Beaver Ridge, Rocky Point, Walde, Black Mountain, and Coolwater Lookout, a shared lookout with the Nez Perce Forest. Three very important lookouts, Bear Mountain, Osier Ridge and Hemlock Butte, could not be staffed in 2003 due to safety deficiencies that could not be corrected on short notice.

The type of detection, number of fires located and percentage of the total number of fires detected is displayed in Figure 1. Orofino Aviation provided three exclusive use and two optional use single engine light fixed wing aircraft for fire recon, relief air attack, fire mapping, detection and point-to-point passenger service for the Clear/Nez Fire Zone. During 2003, these fixed wing aircraft amassed 265 flight hours on the Clearwater Forest.

Figure 1. Fire Detection

Detector	Number of Fires	Percent
Lookout	36	31
FS Aircraft	57	48
Other Aircraft	2	2
FS Employee	19	16
Other	2	2
Permittee	0	0
Cooperator	1	1

Figure 2. Number of Fires by Cause – 2003

Cause	# Fires	Percent	Acres
Lightening	113	96	40,707.4
Equipment	0	0	0
Smoking	0	0	0
Campfire	1	1	2
Debris Burning	1	1	0.1
Children	1	1	0.1
Fireworks & Arson	1	1	0.1
Miscellaneous	0	0	0
Total	117	100%	40,709.7

The Clearwater National Forest had four person-caused fires that burned a total of 2.3 acres. Figure 2 displays the causes of fires for FY03.

Although very high fire danger indexes were common across the Forest, observed fire behavior did not always reflect this as most fires remained small and were suppressed at a small size.

FIRE SUPPRESSION

The Clearwater National Forest is responsible for the protection of approximately 1,715,726 acres of land. The **Idaho Department of Lands** and **Clearwater Potlatch Timber Protective Association** protect about 146,136 acres of National Forest lands. The three fires that occurred on national forest lands protected by these two agencies were suppression strategy wildfires.

Wildfires were attacked and suppressed in accordance with the Fire Management Action Plan. The intent of the **Clearwater National Forest Plan** standards and guidelines were met by implementing an array of suppression strategies (often called the appropriate management response). Each fire was assessed as to its fire potential and location within each land allocation, and a suppression strategy assigned to best fit each situation. Due to the number of fires and shortage of resources occurring in 2003, only those fires that posed the greatest risk received the limited available resources for suppression actions. In some cases, only portions of fires were contained or controlled to protect critical resource values. Where resource values and risk was low, i.e. backcountry and wilderness areas, many fires were managed under a confinement suppression response or as Wildland Fire Use (WFU) events.

The 2003 fire season was slightly below average on the Clearwater National Forest in terms of numbers of fires. The 10-year average (1994-2003) for number of fires is 147.5. However, the 2003 fire season was an exceptional year in terms of total acres burned on the Clearwater National Forest. The previous 10-year average (1993-2002) for acres burned was 4,444.4 acres.

- During FY03, the Forest had **117** fires.
- **40,709.7** acres burned on the Forest, the largest acreage since accurate record keeping began in 1921.

Significant fires during 2003 included:

- Beaver Lakes Complex @ 12,467 acres
- Wendover Fire @ 3,439 acres
- Hopeful #2 Fire @ 3,509 acres
- Pleasant and Rhoads Fires @ 3,868 acres
- Upper Twin WFU @ 1,362 acres

The Forest maintained a good safety record throughout the very tough 2003 fire season.

MIST guidelines were used for all lands protected by the Clearwater National Forest. MIST guidelines are specifically written to protect resource values within wilderness, research natural areas, cultural sites and any other sensitive areas from fire suppression impacts.

The Clear/Nez Fire Zone provided extensive support to the Southwest, Rocky Mountains, and Pacific Northwest areas during the spring and summer seasons. Our first crew dispatch was May 2 and the last crew out returned home on November 8. In total the Zone and its partners mobilized 88 crews, 95 engines and filled approximately 450 overhead positions.

AVIATION

Two 800 gallon 802 Single Engine Air Tankers (SEATs) (Evergreen Flying Service, Rayville, LA) under contract to the Idaho Department of Lands were managed by and based at the Grangeville Air Tanker Base in 2003 for retardant delivery in west central Idaho. These aircraft delivered 6,950 gallons of retardant for fire operations at Ashpile, Hopeful #2, and Beaver Lake fires on the Clearwater National Forest. 27,037 gallons were delivered to the Beaver Lake Complex on the Powell RD from Missoula, and the portable retardant plant established to support that complex provided an additional 70,234 gallons via helicopter.

The Clear/Nez Fire Zone exclusive use helicopter contract was renewed with Hillcrest Aircraft Company for the 2003 fire season. Two Bell 206 L-3 Type 3 helicopters, with high performance kits were provided. Heli-

copter N861H was based at the Musselshell Work Center, while the second helicopter was based at Grangeville Air Center. The Zone Call-When-Needed Contract was also renewed with Hillcrest. A total of 29 different helicopters were utilized on the Zone in 2003, 11 Type 1, 12 Type 2 and 6 Type III.

During the 2003 fire season, 446.4 Exclusive Use hours were flown on the Clear/Nez Fire Zone. Additionally, the Exclusive Use helicopters flew 61.4 hours for neighboring forests, and in Region 4, for fire and project work. Of the total hours flown 160 hours were on fire assignment on the Clearwater National Forest. The L3 and crew based at the Musselshell were committed to WY and UT for a two-week fire assignment during July. They spent the remainder of their time on-Zone. The exclusive use helicopters transported 191 passengers, 40,875 pounds of cargo and delivered 41,830 gallons of water to suppress Clearwater NF fires.

WILDLAND FIRE USE

This part of the FMP manages naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in fire management plans. Each fire use event meets strict prescription criteria prior to line officer approval; and a site specific Wildland Fire Implementation Plan (WFIP) is developed.

- This option was selected for 19 fire starts in 2003, 14 within the Selway-Bitterroot Wilderness and 5 within the Clearwater Fire Management Unit. These fires burned a total of 7,544 acres.
- Many lightning ignitions did not meet wildland fire use prescription criteria due to high fire danger indexes in the Region and due to the National fire situation. However, resource shortages required fire managers to prioritize use of scarce resources and as a result many fires not specifically being managed for resource benefit were burning unchecked where risk to life and property were low. Significant resource benefit was realized on these fires as well.

FUELS REDUCTION

Brush disposal trust funds were used to treat 504 acres of timber harvest related fuels in fiscal year 2003. Conditions remained very dry through the end of the September increasing the risk of burning, particularly at the lower elevations.

The Hazardous Fuel budget for the Clearwater was $693,500 in FY03. With the dollars, the Forest treated 3,083 acres of natural fuels. Two environmental documents were completed and several new projects were initiated for out-year treatments. FY03 target was 4,890 acres. The North Fork District accomplished 55 acres, Powell treated 1,364 acres, and the Lochsa treated 700 acres, while the Palouse District treated hazardous fuels on 964 acres.

Extended dry conditions through September increased the risk of igniting additional acres before the end of the fiscal year, limiting the Forest's opportunity to meet its target acreage. The North Fork District took advantage of late season conditions igniting several landscape scale burn blocks in the Upper North Fork of the Clearwater, accomplishing almost 5,000 acres which will be credited toward the FY04 target.

AIR QUALITY

Prescribed burning was accomplished during the spring and fall burning periods. Smoke management from prescribed fires was managed within the guidelines of the North Idaho Airshed Group. Burn operations on the Forest were impacted on several occasions by smoke production limitations. No specific air quality monitoring was done within the Forest.

FISHERIES

GOAL

Manage the Forest's fisheries streams to achieve optimum levels of fish production by rehabilitating and improving streams on developed areas of the Forest and by maintaining high quality existing habitat.

STRATEGY

- Provide management direction during the planning and implementation of activities. Identify and implement rehabilitation projects on the Forest.
- Emphasis in habitat improvement will be directed toward the sensitive species of bull trout, steelhead trout, Westslope cutthroat trout and spring Chinook salmon.
- The Forest will focus the challenge cost-share program on anadromous fish habitat improvement associated with fisheries in the Columbia River Basin and the direction of the Northwest Power Act. The Forest will develop cost-share partners and projects.
- The Forest fisheries biologist will direct development of fisheries expertise and monitoring across the Forest. Information regarding restoration and monitoring projects and the results are available for anyone interested.
- Ensure Forest activities meet the Forest Plan standards, especially PACFISH and INFISH standards that were included in a Forest Plan amendment.
- Ensure Forest activities meet the terms and conditions as defined in the steelhead trout and bull trout biological opinions.

ACCOMPLISHMENTS / FINDINGS

PACFISH

No formal review by the PACFISH Implementation Review Team was conducted on the Forest in 2003. Since 1995, the Forest has been conducting the PACFISH/INFISH monitoring programs in conjunction with the annual Best Management Practices (BMP) reviews to determine project implementation compliance and effectiveness of resource protection measures on selected projects. Due to an active fire season, no PACFISH reviews were completed during 2003; the reviews were rescheduled for 2004.

INFISH

Similar to the PACFISH reviews, no INFISH reviews were completed in 2003; the reviews were rescheduled for 2004.

Item No. 8 – Water Quality and Stream Condition for Fisheries and Non-Fisheries Beneficial Uses

Frequency of Measurement: Annual
Reporting Period: Annual

Information for Non-Fisheries is included in the section entitled **Soil and Water** under **Item 8.**

MONITORING ACTION

The Forest fisheries biologist will coordinate the monitoring of critical anadromous and inland fish streams to determine habitat conditions and population trends. District field crews will measure key habitat char-

acteristics, such as cobble embeddedness (the degree to which streambed gravel has been infiltrated by sediment).

Streams supporting both anadromous and inland fish were monitored during 2002. During 1998, the 1997 monitoring program was expanded and intensified to include more monitoring of anadromous and inland fish streams that were impacted as a result of the high flows, flooding and landslides within the Palouse River, Lochsa River and the North Fork Clearwater River drainages. In 1999, this intensity was maintained or expanded in most drainages. However, similar to 2000-2002, monitoring efforts in 2003 were substantially decreased from previous years due to budget constraints.

ACCOMPLISHMENTS / FINDINGS

FOREST OVERVIEW

Stream Inventory Targets: Due to budget constraints and fire restrictions, the Forest did not complete any stream inventories in 2003.

Improvement Targets: Due to budget constraints, project targets in 2003 focused on riparian protection regarding grazing and fish passage improvement projects. Approximately 19 miles (41 acres) of fisheries habitat improvement were completed.

The 2003 stream improvement projects were completed on various streams throughout the Forest. As in past years, riparian fencing projects involving fence replacement, construction and maintenance were completed to meet Forest Plan Riparian Management Objectives (RMOs). Fisheries funds were used in several partnership projects in 2003 to improve fish passage. Forest funds and funds from the Nez Perce Tribe were used for culvert replacements in the Lolo Creek and Lochsa River drainages. Due to fire related closures on the Forest, the scheduled improvement work regarding inland fisheries on high mountain lakes was cancelled.

Stream Temperature Monitoring: The stream temperature-monitoring program was expanded in 2002 to approximately 300 sites across the Forest. This includes streams that were monitored during the summer of 2003 and additional multi-year units deployed during 2002 to collect 2002, 2003 and/or later years. This was a moderate increase over the 230 sites monitored during 1998-1999 and a substantial increase over the budget-reduced number of sites during 2000-2001. This monitoring report summarizes the data collected during 2003 on 301 sites on 260 streams. Temperature data for 54 sites are not available (instruments still instream, missing units, equipment failures, or exposed units prevented data collection). During 2003, only nine units were lost, vandalized or had equipment failures; this is approximately three percent of the units deployed in 2003. Dependent upon budgets, streams will be monitored for at least five consecutive years.

The 2003 summer showed slightly below average stream flows during the summer months. Preliminary air temperature analysis indicates that the summer of 2003 was an average summer that was slightly warmer than the summer of 2002. In comparison, the summer of 2002 was slightly cooler than the summers of 2000 and 2001. The below average stream flows coupled with the warmer air temperatures allowed stream temperatures to stabilize at warmer temperature during July through mid-September. In 2003, approximately seven percent of the streams monitored exceeded the State's cold water biota standard. This is a two percent increase over 2002 data (6.5% vs. 4.4%). While lower stream flows and warmer water temperatures most likely contributed to the higher number of streams exceeding the State cold water biota standard, some of this difference can be attributed to 39 additional monitoring sites in 2003.

Over the past several years numerous questions have been raised as to why streams are not meeting various standards. While stream flows and associated snow pack in the drainages and the average summer ambient air temperatures affect stream temperatures during the summer months, the maximum daily temperatures are also regulated by various other factors, some unique to individual drainages. However, these factors as well as favorable high stream flows and cooler summer air temperatures may not be enough to keep stream temperatures from rising above imposed numeric standards.

As an example, a comparison of available 2003 stream temperature data from streams (164 streams) located in wilderness/roadless/undeveloped areas and developed areas within the two major subbasins

(Lochsa River and North Fork Clearwater River) did not show any difference in streams meeting the State spawning standard of 13º C. Only eight streams out of the 71 streams (11%) within wilderness/roadless/undeveloped areas met State spawning standards for steelhead trout and westslope cutthroat trout. In comparison, only ten streams out of the 93 streams (11%) within developed areas met applicable State spawning standards (i.e. steelhead trout, westslope cutthroat trout, and spring chinook salmon). While various variables (i.e. stream size, fire history, riparian alterations, riparian recovery, mean elevations, etc) would influence conclusions if further comparisons are made, the overall outcome of the above comparison indicates the difficulty of attaining the State spawning standard of 13º C for the selected spawning periods. Data from 170 streams located in wilderness/roadless/undeveloped areas and developed areas within the two major subbasins (Lochsa River and North Fork Clearwater River) showed 70 out of 71 streams (99%) located in wilderness/roadless/undeveloped areas met the State cold water biota standard while 96 out of 99 streams (97%) in the developed areas of the drainages met the standard.

Fish Population and Habitat Monitoring: Fish population numbers and/or stream substrate conditions were monitored in selected drainages in the Lolo Creek, Lochsa River and North Fork Clearwater River watersheds. Personnel from the Idaho Department of Fish and Game, Nez Perce Tribe, U.S. Fish and Wildlife Service, and Idaho Department of Environmental Quality also monitored fish populations within various streams on the Forest; these monitoring projects were coordinated with the Forest programs to avoid unnecessary duplication of monitoring efforts.

Several larger monitoring projects included the post flood monitoring on established stream reaches and cooperative bull trout studies with the Idaho Department of Fish and Game (IDFG). As in 1997 and 1998, the Forest scheduled resurveys (via contract) of habitat and substrate conditions on selected sensitive stream reaches within 16 streams that were affected by the 1995/96 flood event. Due to time constraints in 2002, this monitoring project was re-scheduled to be completed in 2003. The cooperative bull trout study within the North Fork Clearwater River drainage was continued in 2003. The study was expanded to include the Lochsa River drainage in 2003. The IDFG marked and monitored movements of 150 and 20 adult bull trout within the North Fork Clearwater River and Lochsa River respectively. The Forest assisted in conducting fish population monitoring and spawning ground surveys

Item No. 31 – Anadromous Fisheries

POTLATCH RIVER WATERSHED

Watershed Status: No natural or anthropogenic events occurred on USFS lands in the Potlatch River watershed during 2003 that caused changes to the aquatic environment. Instream conditions and riparian conditions did not show any substantial changes due to climatic, spring stream flows, erosion (sedimentation due to surface and mass wasting events), and management activities (i.e. roads, vegetative treatments, mining and grazing). Various field reviews and monitoring activities have supported the conclusion that the habitat conditions are most likely similar to 1998-2002 conditions. Based on these assessments, the presence/absence and relative abundance of fish populations within the watershed are assumed to be similar to conditions observed during 1994-95 surveys. However, anadromous fish numbers may vary annually due to influences outside the watershed and fish supplementation efforts by the Nez Perce Tribe involving coho salmon.

Habitat Improvement: The fisheries (funded) enhancement and riparian fencing projects within the Potlatch River drainage assisted in the improvement and/or protection of approximately 8.5 miles of stream. In addition to the annual fence maintenance, permanent fences were constructed along the East Fork Corral Creek and East Fork Big Bear Creek to protect approximately 1.25 miles of stream. No other major watershed restoration activities (i.e. road obliteration, instream restoration projects) were scheduled in 2003.

Habitat Monitoring: The mainstem Potlatch River and various tributaries have been designated a "water quality limited segment" (WQLS) by the State of Idaho. The primary pollutant of concern is sediment although the Forest notes that water temperatures are also a concern in the Potlatch River drainage. Past, current, and future monitoring within the Potlatch River drainage will emphasize substrate conditions in terms of sediment and stream water temperatures. Since the stream inventories of all fish-bearing streams within the Potlatch River drainage on National Forest System lands have been completed within the last ten

years, no additional surveys were scheduled for 2003. Selected stream reaches within the mainstem Potlatch River and several tributaries are scheduled for survey in 2004

Water Temperature Monitoring: Stream temperature monitoring was conducted at 14 sites on 9 streams in the Potlatch River drainage in 2003 to evaluate habitat conditions for steelhead trout. From 1990-1996 and 1998-2003 the Forest has collected temperature data on selected stream within the Potlatch River drainage to determine if stream temperatures meet Forest and State standards, locate temperature problems, identify recovery trends, and prioritize riparian recovery efforts. Thirteen years of thermograph data indicate that most of the streams have summer stream temperatures that are higher than the desired objectives for salmonid rearing. In most years, all temperature sites within the Potlatch River system exceeded the desired future condition (DFC) for temperatures during the spring spawning period and all temperature sites within the Potlatch River system exceeded the State spawning standard of 13°C during the spring.

Nat Brown Creek (upper), Ruby Creek and the Potlatch River (upstream West Fork Potlatch River) exceeded the standard for four days respectively. Four of the 13 sites, Cougar Creek, Feather Creek, Moose Creek (upstream Moose Creek Reservoir), and West Fork Potlatch River (downstream Talapus Creek) met the DFC for steelhead trout rearing.

Four sites, mainstem Potlatch River (at Little Boulder Creek), West Fork Potlatch River (downstream of Stout property), East Fork Potlatch River (mouth), and Moose Creek (downstream of Moose Creek Reservoir) exceeded the State standard for cold-water biota of the daily maximum of 22°C and the maximum daily average of 19°C. The State temperature standard of 13°C or below for the spring spawning period (for steelhead trout) was not met at any of the 13 sites. All streams exceeded the bull trout maximum rearing temperature of 10°C (consecutive seven-day average of daily maximums during June-September) that has been promulgated by EPA as a final rule for water quality standards.

Fish Population Monitoring: Steelhead redds have been monitored in the East Fork Potlatch River since 1992 twice a year (April and May). These surveys have shown a consistently low number of redds from three to eight. During the 2003 spawning period, six steelhead redds were observed in the index area.

LOLO CREEK WATERSHED

Watershed Status: No natural or anthropogenic events occurred in the Lolo Creek watershed during 2003 that caused changes to the aquatic environment. Instream conditions and riparian conditions did not show any substantial changes due to climatic, spring stream flows, erosion (sedimentation due to surface and mass wasting events), and management activities (i.e. roads, vegetative treatments, mining and grazing). Various field reviews and monitoring activities have supported the conclusion that the habitat conditions are most likely similar to 1998-2002 conditions. Based on these assessments, the presence/absence and relative abundance of fish populations within the watershed are assumed to be similar to conditions observed in previous years. However, anadromous fish numbers may vary annually due to influences outside the watershed and fish supplementation efforts by the Nez Perce Tribe involving spring chinook salmon.

Habitat Improvement: Due budget constraints, aquatic restoration and enhancement work within the Lolo Creek watershed were primarily completed with engineering and Tribal cooperative funds in 2003. Fisheries funds were used to assist the projects in the environmental analyses, ESA consultations and project implementation and effectiveness monitoring. The projects were primarily associated with watershed restoration activities such as fish passage improvement, road decommissioning, and road maintenance work. In conjunction with the ongoing watershed restoration projects, the Forest concentrated fish enhancement efforts on two culvert replacement projects. The Nez Perce Tribe provided funds to purchase and installation of a culvert at Cedar Creek (mouth) and the removal of a culvert within lower May Creek (Cedar Creek drainage). The Forest provided funds for the project design, environmental analyses, consultations and monitoring. Fisheries, watershed and engineering funds were used in a cooperative Forest effort with funds from the Nez Perce Tribe in the decommissioning of approximately 10.1 miles of road within the Eldorado Creek drainage.

Habitat Monitoring - Lolo Creek Drainage: The mainstream Lolo Creek and nine tributaries have been designated a WQLS by the State of Idaho. The primary pollutants of concern are sediment and water temperature. Past, current, and future monitoring within the Lolo Creek drainage will emphasize substrate conditions in terms of sediment and stream water temperatures. Stream inventories of all fish bearing

streams within the Lolo Creek drainage have been completed on National Forest System lands between 1991and 1994. Resurveys of specific streams are planned every five to ten years dependent upon stream conditions and management proposals. In 1998, approximately 20 miles of the mainstem of Lolo Creek were resurveyed to assess any changes in habitat stream conditions from surveys conducted in 1988 and 1993. Due to budget constraints, Eldorado Creek and Musselshell Creek resurveys that were scheduled in 2002 and 2003 were not completed.

Water Temperature Monitoring - Lolo Creek Drainage: A cooperative arrangement to monitor selected key tributaries within the Lolo Creek system was initiated in 1990 between the Nez Perce Tribe and the Pierce Ranger District. In general, past monitoring data has indicated that stream temperatures in Lolo and Musselshell creeks exceeded the desired criteria (16-17°C) by several degrees and maintained these high temperatures for extended periods of time. However, the data shows that the number of days in which these systems exceeded the standard has decreased since 1990.

Stream temperatures were monitored throughout the summer at 21 sites on 19 streams (only USFS sites) within the Lolo Creek drainage to evaluate habitat conditions for steelhead trout, spring chinook salmon, westslope cutthroat trout and bull trout. The following data is for Lolo Creek tributaries operated by the Forest, as the data recorders operated by the Nez Perce Tribe (i.e. Camp Creek, Eldorado Creek etc.) have not been summarized. In addition, the temperature data for Lolo Creek is unavailable as the unit is still out in the field. Comparison of the 2003 stream temperature data from the 20 monitoring sites on the 19 streams with available data and the desired maximum temperatures as defined for appropriate standards in the Forest Plan revealed that:

1. The desired steelhead trout rearing temperature of 17°C was met at six streams (Dutchman Creek, Mike White Creek, Nevada Creek, Fan Creek, Lunch Creek, and Trout Creek) out of the ten streams monitored with a "high fishable" standard. Eldorado Creek, Musselshell Creek, Knoll Creek and Yoosa Creek did not meet the "high fishable" standard for steelhead trout rearing. Lolo Creek data is unavailable at this time.

2. The desired spring chinook trout rearing temperature of 17°C was not met at the current or potential spring chinook salmon streams (Eldorado Creek and Musselshell Creek).

3. The desired westslope cutthroat trout rearing temperature of 16°C or below was met at three streams (Brick Creek, Panther Creek, and White Creek) out of the seven streams monitored with a "high fishable" standard. Chamook Creek exceeded the standard for two days. Gold Creek and Mud Creek met the desired rearing temperature of 18°C or below (moderate fishable standard) while the desired rearing temperature of 20°C or below (low fishable standard) was met in Dan Lee Creek.

Overall, water temperatures within 18 of the 19 streams were under the State standard for cold-water biota; water temperatures did not exceed the daily maximum of 22°C and the maximum daily average of 19°C. The temperature data showed Musselshell Creek (at the mouth) exceeded the State cold-water biota standard. The State standard of 13°C for the spring spawning period (steelhead trout) was not met at any site. However, four streams (Dutchman Creek, Lunch Creek, Fan Creek and Trout Creek) exceeded the spawning period standard by eight days or less. All streams exceeded the bull trout maximum rearing temperature of 10°C (consecutive seven-day average of daily maximums during June-September) that has been promulgated by EPA as a final rule for water quality standards.

Fish Population Monitoring - Lolo Creek Drainage For the last 15 years, population assessments were conducted via snorkeling to document trends in Lolo Creek; 15 permanent transects established in 1988 were sampled (10 log weir pools and 5 control sites). In 2003, the Forest sampled the 15 permanent transects; fish density information showed that the low numbers of steelhead juveniles observed in 2003 followed the projected trends when compared to 1994-2002 population information. However, the numbers of spring chinook juveniles continued to be very high.

Steelhead trout (age 1+) densities of 2.11 fish/100 m^2 observed in 2003 were the highest observed by the Forest since in Lolo Creek since 1995 (Figure 1). However, the population data continues to indicate that steelhead trout production is very low in Lolo Creek. The low densities of steelhead trout (2.11 age 1+ fish/100 m^2) observed by the Forest were validated by the Nez Perce Tribe's snorkeling work. The Tribe's

monitoring project involves snorkeling similar stream reaches within the mainstem of Lolo Creek. The Tribe observed lower densities (1.22 fish/100 m²) within the same index area (Nez Perce Tribe 2003)[1].

Densities of spring chinook juveniles were the highest observed by the Forest during the 16-year monitoring period. In 2003, densities of spring chinook juveniles (age 0+) averaged 91.8 fish/100m^2 (Figure 3). The high densities of spring chinook salmon observed by the Forest were validated by the Nez Perce Tribe's snorkeling work. The Tribe's monitoring project involves snorkeling similar stream reaches within the mainstem of Lolo Creek. The Tribe observed higher densities (103.01 fish/100 m²) within the same index area (Nez Perce Tribe 2003)[2].

The high densities in 2003 were most likely the result of the high number of adults and resultant redds (206) during the 2002 spawning season. This is substantially higher than the lowest densities (0.21 fish/100m^2) documented by the Forest in 1996 moderately higher than the highest densities (78.7 fish/100m^2) documented in 1998.

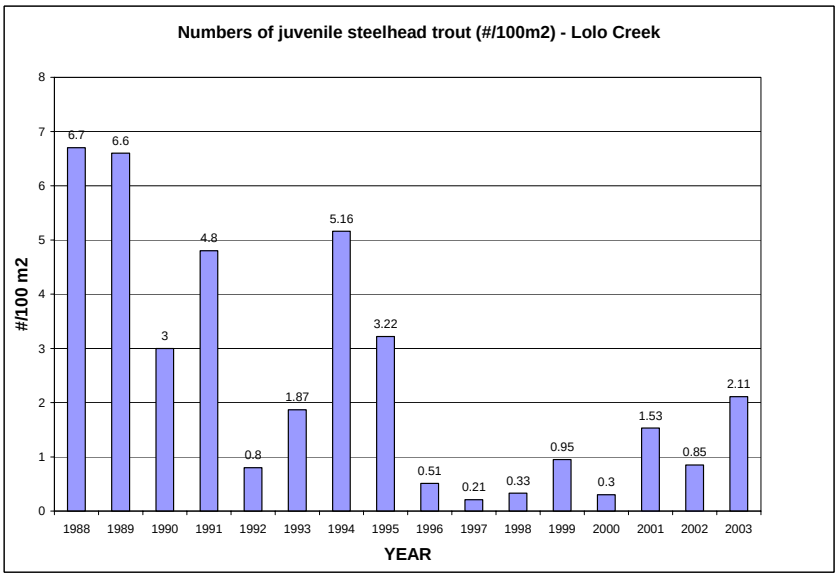
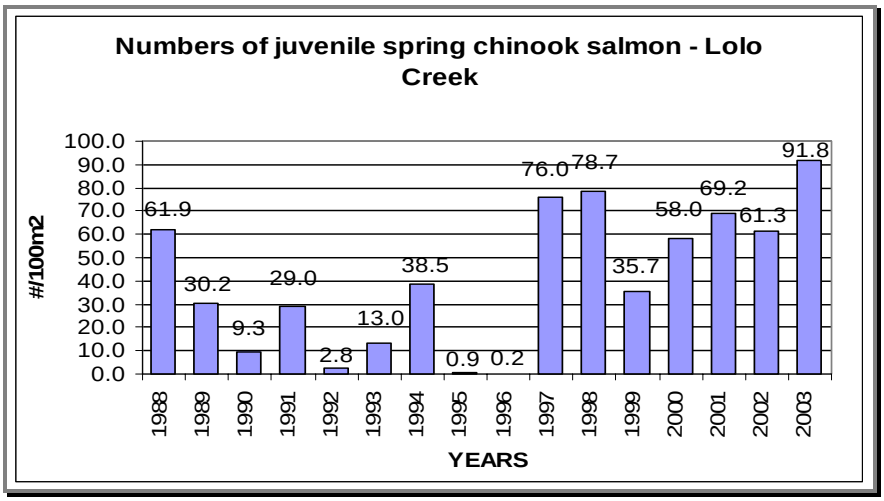


Figure 3: Average densities (#/100m²) of juvenile steelhead trout (age 1+) survey period 1988-2003.

Figure 4: Average densities (#/100 m²) of juvenile spring chinook salmon (age 0+) for survey period 1988-2003.



Since 1992, the Nez Perce Tribe has also conducted fish population assessments in Lolo Creek tributaries such as Yoosa Creek, and Eldorado Creek. The Tribal data supplements the Forest's data and is complementary in the establishment of trends for steelhead trout and spring Chinook salmon.

[1] Nez Perce Tribe 2003. Provisional data received via email from Scott Struhs, fisheries biologist, Nez Perce Tribal Fisheries Department, Orofino, Idaho.

[2] Nez Perce Tribe 2003. Provisional data received via email from Scott Struhs, fisheries biologist, Nez Perce Tribal Fisheries Department, Orofino, Idaho.

As part of the continuing Idaho Supplemental Studies being conducted in the Lolo Creek drainage, the Nez Perce Tribal Fisheries Department completed the 2003 Lolo Creek spring Chinook spawning ground surveys. These surveys were conducted in the main stems of Lolo, Eldorado, Musselshell, and Yoosa creeks.

Results of the 2003 surveys indicated that a total of 69 redds were located within the Lolo Creek drainage; 68 were located within mainstem Lolo Creek and one within lower Yoosa Creek No redds were observed in Musselshell Creek, and lower Eldorado Creek downstream of Eldorado Falls (Figure 3). The number of redds within the Lolo Creek drainage was about 14 percent of the 2001 redd count (the highest in the 16-year monitoring period). However the 2003 redd count was nearly twice as high as the 1988-2000 average of 36 redds. The reason for the relatively high number of redds in 2003 is the successful spawning of natural-returning spring chinook salmon. Unlike 1999-2001, no hatchery supplementation of adult spring chinook salmon was done by the Tribe during the 2002 and 2003 spawning seasons.[3] However, the redd count was expected to be much higher due to the high number of spring chinook adults migrating into Lolo Creek; based on Tribal fish trap counts. The Tribe observed high pre-spawning mortality of adults in Lolo Creek as well as in the holding ponds at the Tribal hatchery facility.[4]

OROFINO CREEK WATERSHED

Watershed Status: No natural or anthropogenic events occurred in the USFS drainages within the Orofino Creek watershed during 2003 that caused changes to the aquatic environment. Instream conditions and riparian conditions did not show any substantial changes due to climatic, spring stream flows, erosion (sedimentation due to surface and mass wasting events), and management activities (i.e. roads and vegetative treatments). No major fires occurred in 2003. Various field reviews have supported the conclusion that the habitat conditions for most drainages are most likely similar to 1998-2002 conditions. Based on these assessments, the presence/absence and relative abundance of fish populations within the watershed are assumed similar to conditions observed in previous years.

Habitat Monitoring – Orofino Creek Drainage: As in 2001-2002, stream surveys that were scheduled for Orofino Creek in 2003 were not completed due to budget constraints. Dependent upon funding, surveys will be re-scheduled for 2005.

Water Temperature Monitoring - Orofino Creek Drainage: Due to migration barriers in lower Orofino Creek, streams within the Forest's boundary are considered non-anadromous (no potential for steelhead trout or spring chinook salmon); only water quality and habitat conditions related to resident fish (i.e. westslope cutthroat trout) are monitored and analyzed. As in 1996-2002, Orofino Creek, at the Forest Service boundary, was monitored for summer stream temperatures in 2003. In addition, stream temperature data was collected at five tributary sites and upper Orofino Creek (upper Orofino Creek drainage) during 2003. Comparison of the 2003 stream temperature data and the desired maximum temperatures as defined for the "low fishable" standard in the Forest Plan revealed that the desired cutthroat trout rearing temperature of 20°C or below was met at all sites. State standards for cold water biota were also achieved; water temperatures did not exceed the daily maximum of 22°C and the maximum daily average of 19°C. State standards of 13°C for the spring spawning periods (for westslope cutthroat trout) was not met at any of the sites.

MIDDLE FORK CLEARWATER RIVER WATERSHED

Watershed Status: No natural or anthropogenic events occurred in the USFS drainages within the Middle Fork Clearwater River watershed during 2003 that caused changes to the aquatic environment. Instream conditions and riparian conditions did not show any substantial changes due to climatic, spring stream flows, erosion (sedimentation due to surface and mass wasting events), and management activities (i.e. roads and vegetative treatments). No major fires occurred in 2003. Various field reviews and monitoring activities have supported the conclusion that the habitat conditions for most drainages are most likely similar to 1998-2002 conditions. Based on these assessments, the presence/absence and relative abundance of

[3] Nez Perce Tribe 2004. Personal communication with Sherman Sprague, fisheries biologist, Nez Perce Tribal Fisheries Department, Orofino, Idaho.

[4] Nez Perce Tribe 2004. Personal communication with Sherman Sprague, fisheries biologist, Nez Perce Tribal Fisheries Department, Orofino, Idaho.

fish populations within the watershed are assumed similar to conditions observed in previous years. However, anadromous fish numbers may vary annually due to influences outside the watershed.

Habitat Monitoring - Middle Fork Clearwater River Drainage: Since the stream inventories of all fish bearing streams within the Middle Fork Clearwater River drainage have been completed on National Forest System lands during 1996, no additional habitat surveys were scheduled for 2003.

Water Temperature Monitoring - Middle Fork Clearwater River Drainage: Stream temperatures were monitored throughout the summer at the mouth of Big Smith Creek and Little Smith Creek to evaluate habitat conditions for westslope cutthroat trout. During 1997, the Forest started collecting water temperature data from these streams to determine temperature problems and prioritize riparian recovery efforts. Comparison of the 2003 stream temperature data from Big Smith Creek and Little Smith Creek sites and the desired maximum temperatures as defined for the "high fishable" standard in the Forest Plan revealed that:

> The desired westslope cutthroat trout rearing temperature of 16°C was met only at Little Smith Creek. These two streams are relatively small and do not contain any significant spring chinook rearing habitat. Minimal steelhead trout spawning and rearing occurs in these streams; the westslope cutthroat trout rearing standard and spawning period meets the "high fishable" standards for steelhead trout.

Both Big Smith Creek and Little Smith Creek met the State standard for cold-water biota; water temperatures did not exceed the daily maximum of 22°C and the maximum daily average of 19°C. The State standard of 13°C for the spring spawning periods for westslope cutthroat trout was not met at either stream. Neither stream contains spring chinook spawning habitat. As for bull trout, none of the streams have been designated potential bull trout spawning habitat; both streams exceeded the maximum rearing temperature of 10°C (consecutive seven-day average of daily maximums during June-September) that has been promulgated by EPA as a final rule for water quality standards.

LOCHSA RIVER WATERSHED

Watershed Status: In addition to numerous small fires, eleven major lightning-caused fires (approximately 27,000 acres) occurred in the upper Lochsa River watershed during 2003 that may have caused various changes to the aquatic environment. The Beaver Lakes (12,240 acres – Idaho portion), Hopeful II (1441 acres – Idaho portion), Wendover (3,439 acres), Bears Oil (883 acres), Pleasant (700 acres -20% in the Lochsa River drainage), Siah Lake (598 acres), Fish (3,483 acres), Big Sand (689 acres), McConnell (2,000 acres – Lochsa portion), Greenside Butte (348 acres) and Eagle Creek East (317acres) fires burned between August 8, 2003 and the fall rains in October within primarily headwater drainages. With the exception adjacent to private lands (i.e. Beaver Lakes and Hopeful II fires), suppression efforts were minimal and conducted only to "herd" the fire and keep it within the roadless areas. Suppression activities where taken were well-planned and located away from aquatic areas; post-fire restoration work was minimal.

With the exception of the fires within the wilderness areas (Siah Lake, Fish, Big Sand, McConnell, Greenside Butte and Eagle Creek East fires) the fires were field reviewed during September and October. The wildfires generally exhibited mixed severity mosaic burn patterns with the hottest burn areas located on ridges or dry slopes. Impacts of the reduced streamside cover and the resultant effects on stream temperatures during the summer months have not been quantified, but some increases in summer stream temperatures will most likely occur in the smaller tributaries. However, impacts to the main fish-bearing streams, such as Spruce Creek, Brushy Fork Creek, Storm Creek, Crooked Fork Creek, Wendover Creek, Fishing (Squaw) Creek, and Papoose Creek are expected to be minimal and non-measurable. Effects to the mainstem Lochsa River are most likely nonexistent. Sediment impacts to the fish-bearing streams should be relatively small and localized, and the impacts are expected to dissipate during high spring runoff in 2004.

Besides these fire events, no additional natural or anthropogenic events occurred within the Lochsa River watershed during 2003 that caused changes to the aquatic environment. Instream conditions and riparian conditions did not show any substantial changes due to climatic, spring stream flows, erosion (sedimentation due to surface and mass wasting events), and management activities (i.e. roads, vegetative treatments, mining and grazing). Various field reviews and monitoring activities have supported the conclusion that the habitat conditions are most likely similar to 1998-2002. Monitoring efforts have shown some improvement and degradation in specific drainages that were impacted by the 1995/96 floods. Based on these assessments, the presence/absence and relative abundance of fish populations within the watershed

are assumed similar to conditions observed in previous years. However, anadromous fish numbers may vary annually due to influences outside the watershed.

Habitat Improvement - Lochsa River Drainage: Due to changes in the budget process, most work regarding the aquatic resources were focused on watershed restoration (i.e. road decommissioning and culvert replacement). Aquatic funds supplemented Forest funds from the engineering and watershed and BPA funds from the Nez Perce Tribe to complete road decommissioning activities in several drainages and two culvert replacement projects in the Lochsa River drainage. The Nez Perce Tribe provided the Forest funds to replace the culverts. The Forest and Tribe participated in the design, implementation and monitoring of these two projects. These activities improved access for adult anadromous and inland fish and allowed for unimpeded access for juvenile fish and other aquatic species to an additional 7.5 miles of stream.

Lower Lochsa River Area: Two major watershed restoration activities involving culvert replacement and road decommissioning projects were scheduled during 2003. A culvert replacement project (USFS road #101) in the upper Pete King Creek drainage was completed in 2003. The large culvert replacement project provided an additional 3.5 miles of habitat for steelhead trout and resident fish. The Forest also decommissioned (converted road to trail) approximately 3.1 miles of road in the lower Pete King Creek drainage; this road decommissioning work will reduce the chronic road failures problems along the lower reach of Pete King Creek. Additional watershed restoration activities including substantial road obliteration and riparian planning projects are proposed under the North Lochsa Face analysis.

Upper Lochsa River Area: In conjunction with the ongoing watershed restoration projects, the Forest concentrated fish enhancement efforts on one culvert replacement project. The Nez Perce Tribe (as part of their fish habitat improvement projects funded by the Bonneville Power Administration) provided funds to remove an existing culvert and construct a bridge on the East Fork Papoose Creek. This culvert replacement project re-opened approximately four miles of stream for the migration of aquatic organisms, including juvenile and adult steelhead trout, bull trout and westslope cutthroat trout.

The main habitat restoration activity within the upper Lochsa River drainage involved the road decommissioning project in the Badger Creek and Parachute Creek (Papoose) drainages. Fisheries, watershed and engineering funds were used in a cooperative Forest effort with funds from the Nez Perce Tribe in the decommissioning of approximately 23 miles of road within the upper Lochsa River drainage. The road decommissioning work reduced potential erosion sources and mass wasting areas and is expected to accelerate the recovery (stream channel and habitat conditions) of approximately 2.1 and 2.0 miles of Badger Creek and Parachute Creek respectively (see *Road Decommissioning section*).

Habitat Monitoring - Lochsa River Drainage: Stream inventories of all fish bearing streams within the Lochsa River drainage have been completed on National Forest System lands during 1990-1997. Resurveys have been conducted on several streams (Pete King Creek, Deadman Creek and Walton Creek) in 1998-1999. As part of a research study regarding the effects of road obliteration on instream conditions, the Forest resurveyed Badger Creek in 2001. Due to the Crooked Fire in 2000, resurveys were completed on Rock Creek and Haskell Creek in 2002. In 2003, no re-surveys were scheduled within the Lochsa River drainage. However the Forest did continue the 1995-1996 flood monitoring project via contract and the substrate-monitoring project in the Pete King Creek and Deadman Creek drainages.

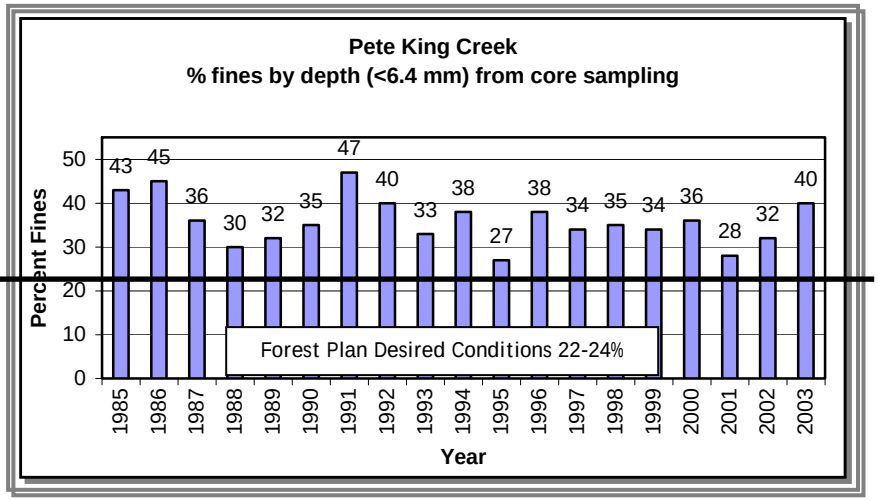
In addition, stream channel and substrate conditions were monitored at permanent sites on several streams (Boulder Creek – Lochsa tributary, Warm Springs Creek, Weir Creek, Postoffice Creek, and Badger Creek). See **Riparian section** for more information.

Lower Lochsa River Area: The Forest continued the substrate-monitoring project in Pete King and Deadman creeks to determine trends of sediment (% fines by depth) in steelhead trout spawning areas. This monitoring consists of measuring the substrate particles that are collected by digging a core into the stream bottom at permanent stations. These stations have been monitored for the last 15 years. Preliminary analysis of the data indicates that the percentage of sediment (fine sediment < 6.4 mm) within the substrate of both streams have ranged between 27% and 45% fines. After showing a decline in 1997, Pete King stabilized for three years (1998-2000) around 34-36% fines, but has recently shown an increasing trend (Figure 4). Deadman Creek showed a declining trend in percent fines between 1996 and 1998, but showed the percent fines increasing substantially between 1999 and 2000 and maintaining

the high level the past two years (Figure 5). Although budget constraints prevented data collection in 2001, data was collected during 2002 and 2003. At both streams, the levels are still above the desired conditions of 22-24% for the "high fishable" Forest Plan standard.

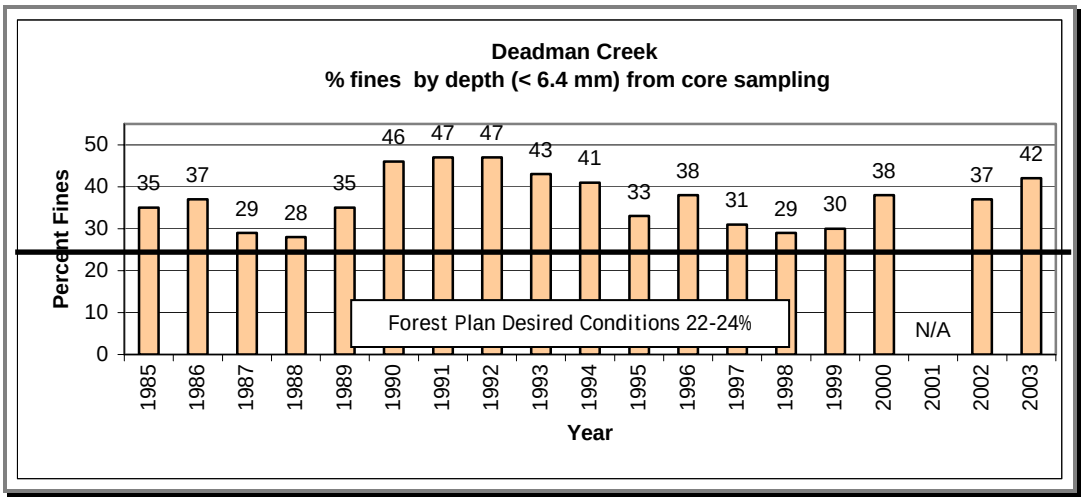
In Pete King Creek, the percent fines showed a moderate increase of eight percentage points in 2003. This increasing trend is most likely the result of excess sediment being transported through the system since no new sediment sources (i.e. landslides road failures) were identified during 2000-2003. During the next ten years, barring any flood events, substrate conditions are expected to slowly decrease, but still maintain the moderately high levels of percent fines (30-35%). Recent road obliteration and watershed restoration efforts reduced erosion potential in the upper drainages and reduced the probability of future increases in percent fines. Future road obliteration projects are expected to accelerate watershed recovery and improve substrate conditions.

Figure 5: Average percent fines by depth (< 6.4 mm) for years 1985-2003 at permanent substrate monitoring sites in lower Pete King Creek within the Lochsa River drainage.



At the Deadman Creek stations, the substrate conditions showed the percent fines increasing from 37% to 42% between 2002 and 2003 respectively (Figure 5). Comparison of the percent fines between two time periods, 1990-1994 and 1995-1999, showed that the decreasing trend over the last ten years was significant ($p<0.05$). However, the increases in 2000, 2002 and 2003 most likely shows that the decrease is temporary and that sediment impulses resulting from past anthropogenic activities are still present in the drainage.

Figure 6: Comparison of average percent fines (< 6.4 mm) for years 1985-2003 at permanent substrate monitoring sites in lower Deadman Creek within the Lochsa River drainage. No data was collected in 2001.



Upper Lochsa River Area: As in 1997 and 1998, the Forest completed resurveys of habitat and substrate conditions on selected sensitive stream reaches within 14 streams in the Lochsa River drainage that were affected by the 1995 floods (see *1997 and 1998 Forest Monitoring Reports* for more information). Surveys prior to and after the 1995-96 floods, indicated that the average cobble embeddedness levels increased in 16 of the 19 stream reaches surveyed on eleven of the streams surveyed in 1997.

These increases ranged from 5 to 23 percentage points with the average increase of approximately 14 percentage points; most of the stream reaches showed a substantial increase in cobble embeddedness. Of the 29 stream reaches that were resurveyed in the 1998 monitoring project, 16 reaches showed average cobble embeddedness levels decreasing from 1997 levels (or where 1997 data was not available 1996 levels).

Information collected during 2003 showed average cobble embeddedness levels increased between 1998 and 2003 in 19 stream reaches on nine streams[5]. In contrast, ten stream reaches on seven streams showed decreases in average cobble embeddedness levels during the same time period. The majority of the streams show substrate conditions improving slowly to pre-flood conditions prior to the 2003 survey. This recovery trend is most likely continuing in most of the streams with increased average cobble embeddedness levels as increases were minimal (1-6%) on 14 stream reaches. In addition, the averaged cobble embeddedness levels fluctuated (decreased or increased) between stream reaches within the same stream.

However, the 1998-2003 increases (average cobble embeddedness) in Parachute Creek (12%) and Pete King Creek (4-6% on four stream reaches) do not reflect a recovery trend. A specific caused to the substantial increase in the Parachute Creek drainage is not known at this time; surveys are planned in 2004. However, past road failures and subsequent sediment transport to the smaller tributaries are most likely contributing to the rising trend. The increasing trend in the Pete King Creek drainage is most likely the result of the ongoing transport of the landslide material from the smaller tributaries into the mainstem reaches. The results of the substrate-monitoring project (see above section) are consistent with the 2003 data.

Water Temperature Monitoring - Lochsa River Drainage: Stream temperatures were monitored throughout the summer at 113 sites on 95 streams within the Lochsa River drainage. Temperature data for 32 of these sites are not available (instruments still instream, missing units, equipment failures, or exposed units prevented data collection). The Forest has been collecting water temperature data from 1990-2002 to determine temperature problems and prioritize riparian recovery efforts. In past years, thermograph data revealed that temperatures exceeding the desired rearing temperature criteria by several degrees were maintained for extended periods of time. Comparison of the 2003 stream temperature data from the 81 monitoring sites on the 68 streams with available data with desired maximum temperatures as defined for the "*high fishable*" and "*no effect*" standard in the Forest Plan revealed that:

1. The desired bull trout rearing temperature of 12°C (no effect) was not met at Beaver Creek, the only bull trout designated stream within the Forest Plan.

2. The desired steelhead trout rearing temperature of 15°C (no effect) was met at five streams (Crooked Fork Creek (upstream Brushy Fork Creek), Fishing Creek (Squaw Creek upstream West Fork Squaw Creek), Dan Creek, Fern Creek and Fish Creek (upstream trail 224)) out of the 26 streams monitored with a "no effect" standard. The desired temperature of 17°C (high fishable) was met at 26 streams out of the 32 streams monitored with a "high fishable" standard.

3. The desired spring chinook trout rearing temperature of 15°C (no effect) was met at the one major stream with chinook habitat: Crooked Fork Creek (upstream Brushy Fork Creek).

4. The desired westslope cutthroat trout rearing temperature of 13°C was met at one stream (Stony Creek) out of the five streams monitored with a "no effect" standard while the desired temperature of 16°C (high fishable) was met at 12 of the 17 streams monitored with a "high fishable" standard. Upper Canyon Creek exceeded the standard on only three days.

Overall, water temperatures of 76 of the 81 monitoring sites within the Lochsa River drainage were under the State standard for cold-water biota; water temperatures did not exceed the daily maximum of 22°C and the maximum daily average of 19°C. Fish Creek (upstream Hungery Creek) exceeded the State standard for one day, while the four sites on the mainstem Lochsa River exceeded the standard for 16 to 22 days. The State standard of 13°C for the spring spawning period (steelhead trout) was met at three streams (Fern Creek, Spring Creek and Stony Creek). Two streams, Deadman Creek (downstream West Fork Deadman

[5] Clearwater BioStudies Inc., 2004. Preliminary data - summary of flood resurvey data.

Creek) and Weir Creek also met the standard, but had data collected for only an early portion of the spawning period. The State standard of 13°C for the spring period for westslope cutthroat trout was met at three streams (Bridge Creek, Muleshoe Creek and Stony Creek (partial year data). None of the monitored streams met the bull trout maximum rearing temperature of 10°C (consecutive seven-day average of daily maximums during June-September) that has been promulgated by EPA as a final rule for water quality standards.

Fisheries Population Monitoring - Lochsa River Drainage

Lower Lochsa River Area: As in previous years, fish population monitoring (via snorkeling) of selected streams continued at established long-term monitoring stations. However, budget constraints limited the number of sites to the Pete King Creek, Deadman Creek, Fish Creek and Hungery Creek drainages. Average steelhead juvenile densities at the Pete King Creek sites showed a substantial decrease while densities at the Deadman Creek sites were relatively stable. In 2003, densities at the lower Fish Creek sites were slightly higher than 2002. In comparison, the densities at the lower Hungery Creek sites rebound substantially. Fish species present in some or all of the study streams included spring chinook salmon, steelhead/rainbow trout, westslope cutthroat trout, mountain whitefish and sculpin. No bull trout were observed during the surveys.

Monitoring of age 1+ steelhead trout juveniles within the Pete King Creek and Deadman Creek drainages has been conducted over a number of years to assess the trend in steelhead production within developed watersheds within the lower Lochsa River drainage (Figures 8 and 9).

The 2003 data indicates steelhead trout populations within Pete King Creek have decreased to the lowest level during the 22 year monitoring period. The 2003 densities are substantially below the desired densities of juveniles (age 1+) >15 fish/100m^2 (Figure 8). Fish population data collected by the Forest showed densities of juvenile steelhead (age 1+) averaged about 2.1 fish/100m^2 in lower Pete King Creek. The average densities are about 50 percent lower than densities observed in 2000 and 2001. It is uncertain whether lower densities are a one-year decline or an overall declining trend. In past years, the low numbers of juvenile steelhead trout in Pete King Creek were most likely due to a two conditions: (1) fair-poor habitat conditions have reduced potential spawning and rearing, and (2) low number of adult spawners due to downriver adult and juvenile escapement problems. Habitat conditions are expected to recover slowly until proposed watershed restoration activities (i.e. road obliteration) are completed over the next ten years and vegetative recovery occurs in the riparian areas. Following watershed restoration projects, stream channels will need to undergo undetermined number of spring runoff events to reconfigure the stream channels to reflect more natural and stable conditions.

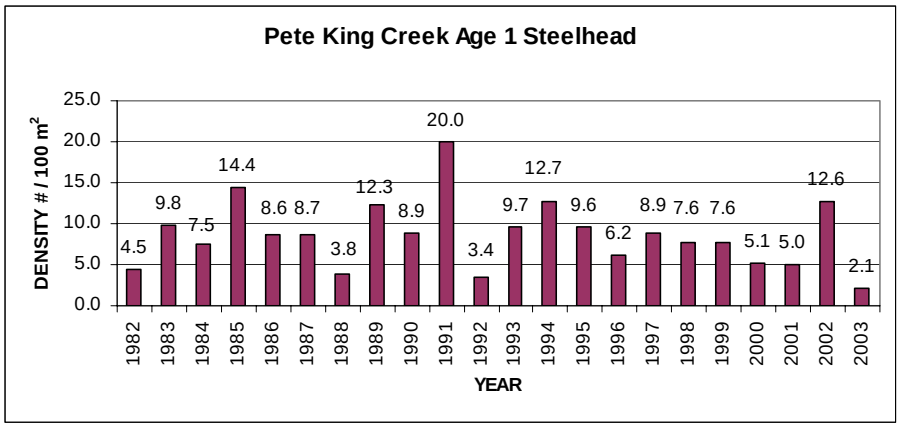


Figure 7: Average densities (#/100m²) of juvenile steelhead trout (age 1+) observed for survey period 1982-2003 permanent snorkeling stations.

The 2003 data indicates steelhead trout populations within Deadman Creek have remain stable since 2000; no sampling was conducted in 2001. Fish population data collected by the Forest showed densities of juvenile steelhead (age 1+) averaged about 15.7 fish/ 100m^2 in lower Deadman Creek; the densities are slightly higher than the desired densities of juveniles (age 1+) >15 fish/100m^2 (Figure 9) and higher than the 20-year average of 11.7 fish/100m^2. It is uncertain whether the relatively high densities observed during 2000, 2002, and 2003 indicate a stable population; data collected in 2004-2006 is needed to support any conclusion.

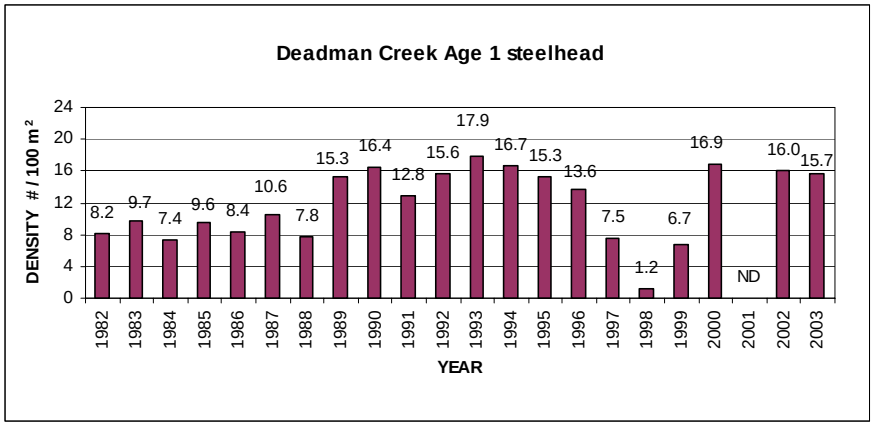


Figure 8: Average densities (#/100m²) of juvenile steelhead trout (age 1+) observed for survey period 1982-2003 at permanent snorkeling stations. No data was collected in 2001.

Monitoring of age 1+ steelhead trout juveniles within the Fish Creek and Hungery Creek drainages has been conducted over a number of years to assess the trend in steelhead production within undeveloped watersheds within the lower Lochsa River drainage (Figures 10 and 11). Budget and time constraints in 2003 limited fish population sampling to sites within lower Fish Creek and lower Hungery Creek. In comparison to the previous year, the average steelhead trout juvenile densities in 2003 showed a slight increase (11%) at the lower Fish Creek sites and a substantial increase (223%) at the lower Hungery Creek sites (Figures 10 and 11). Although juvenile steelhead densities within the Fish Creek and Hungery Creek drainages are relatively good when compared to drainages in the upper Lochsa River, the overall data maintains the downward trend in steelhead production in these streams. As these drainages are basically undeveloped and current habitat conditions appear to be stable, the lower densities are most likely a function of a low number of adult spawners due to downriver adult and juvenile escapement problems.

Juvenile densities (10.5 fish/100m^2) at the Fish Creek sites are below the desired densities of juveniles (age 1+) >15 fish/100m^2 (Figure 10); the densities observed in 2003 were the third lowest during the 21 years of surveys and substantially lower than the period of record (20-year average) of 18.7 fish/100m^2.

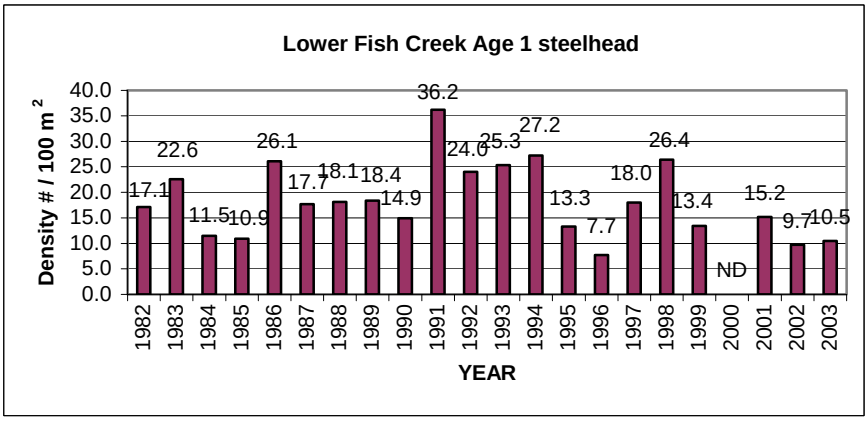
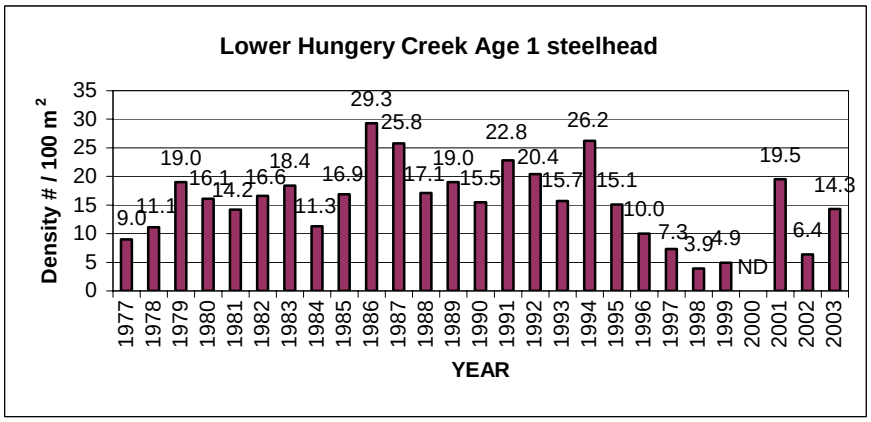


Figure 9: Average densities (#/100m²) of juvenile steelhead trout (age 1+) observed for survey period 1982-2003 at permanent snorkeling stations. No data was collected in 2000.



The densities at the Hungery Creek sites (14.3 fish/100m^2) rebounded to slightly below the desired densities of juveniles (age 1+) >15 fish/100m^2 (Figure 11). The densities observed in 2003 were slightly lower than the period of record (25-year average) of 15.7 fish/100m^2.

Figure 10: Average densities (#/100m²) of juvenile steelhead trout (age 1+) observed for survey period 1977-2003.

As part of the continuing Idaho Supplemental Studies being conducted in the Lochsa River drainage, the U.S. Fish and Wildlife Service completed the 2003 spring chinook spawning ground surveys in lower five miles of Pete King Creek. The survey

found no redds or fish during the 2003 spawning period (U.S. Fish and Wildlife Service 2003)[6]. Spring chinook spawning in Pete King Creek occurs infrequently as 0 redds were found during 1992-96, and 1998-99 survey period. One or two redds were documented during the 1997, 2000 and 2002 spawning seasons. The highest redd count during the 12-year monitoring period was during 2001 when the large spring chinook salmon run into the Clearwater River basin contributed 17 redds.

Upper Lochsa River Area: Due to budget constraints and fire restrictions, the Forest conducted limited fish population monitoring (via snorkeling) in the upper Lochsa River drainage during 2003. Permanent fish population monitoring stations were monitored via snorkeling in Badger Creek, Haskell Creek and Rock Creek. As part of a research study regarding the effects of road obliteration on instream conditions and two culvert replacements, the Forest has been monitoring Badger Creek since 2000. Data collected in 2003 indicates steelhead production is occurring annually with fair to moderate densities (6.20 Age 1+ fish/100 m^2) of juvenile steelhead observed upstream of the culvert replacements. Westslope cutthroat trout were also observed in Badger Creek, but in relatively low densities.

Due to the Crooked Fire in 2000, fish population surveys have been conducted on Rock Creek and Haskell Creek to determine any effects of the fire. Data collected in 2003, continue to show relatively strong populations of westslope cutthroat trout in Haskell Creek and Rock Creek. Juvenile steelhead trout were also observed in Rock Creek, but the numbers were very low. As in past years, the presence of bull trout (low numbers) was observed in the Haskell Creek drainage.

In 2003, the Forest continued bull trout spawning ground surveys on selected streams within the Lochsa River drainage. Approximately 17 miles of stream was surveyed during the spawning period of September through early October. Multiple surveys were conducted on some streams. Appropriate stream segments were selected in nine streams in the upper Lochsa River drainage. The streams included: Fishing (Squaw) Creek, West Fork Fishing (Squaw) Creek, East Fork Fishing (Squaw) Creek, Badger Creek, Haskell Creek, Wendover Creek, Warm Springs Creek, Brushy Fork Creek and Spruce Creek. Spawning (57 redds) was documented in two of the nine streams.

As part of the continuing Idaho Supplemental Studies being conducted in the Lochsa River drainage, the Nez Perce Tribal Fisheries Department completed the 2003 spring chinook spawning ground surveys in Legendary Bear (Papoose) and Fishing (Squaw) Creeks. Results of these surveys indicated that spring chinook spawning were above average in Legendary Bear (Papoose) Creek and Fishing (Squaw) Creek. A total of 21 and 9 redds were located within Legendary Bear (Papoose) Creek and Fishing (Squaw) Creek.

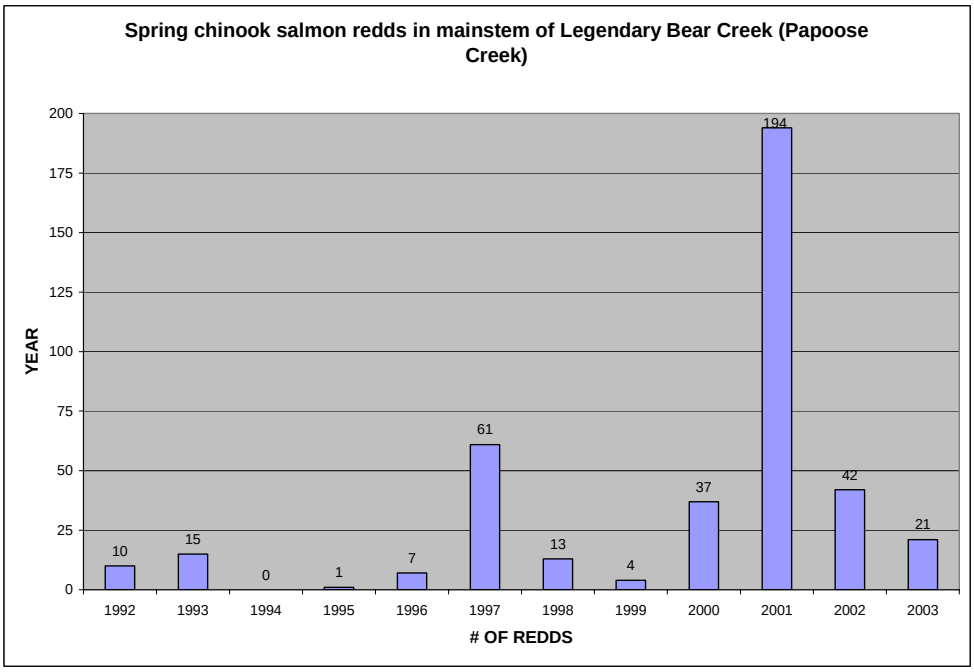
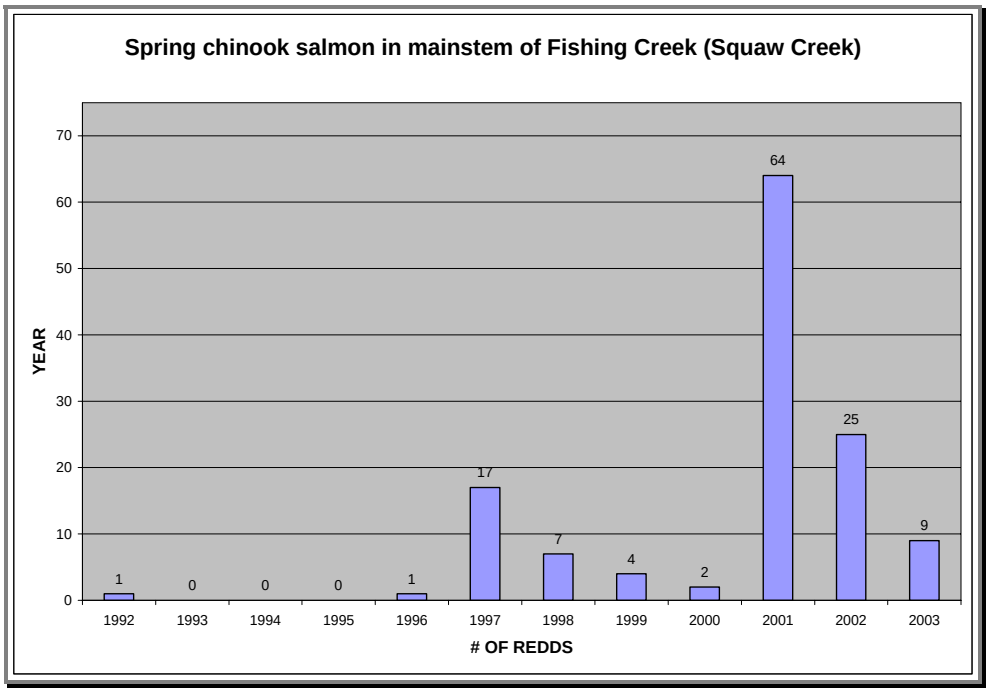


Figure 11: Spring chinook salmon redds observed during 1992-2003 spawning season.

[6] U.S. Fish and Wildlife Service. 2004. Provisional data from Idaho Fishery Resource Office, Dworshak National Fish Hatchery, Ahsahka, Idaho.

This compares to an average of 16.4 redds/year in Legendary Bear (Papoose) Creek and 3.6 redds/year in Fishing (Squaw) Creek during 1992-2000 survey period. The 2003 redd counts were substantially lower than redds counts observed during 2001 and 2002.

Figure 12: Spring chinook salmon redds observed during 1992-2003 spawning season.



Item No. 32 – Inland Fisheries

NORTH FORK CLEARWATER RIVER WATERSHED

Watershed Status: In addition to numerous small fires, four major lightning-caused fires occurred in the North Fork Clearwater River watershed during 2003 that caused changes to the aquatic environment. The Pleasant (3,168 acres - 80% in North Fork Clearwater River drainage), Rhodes (715 acres), Rock Garden (1,118 acres) and Upper Twin (614 acres) fires burned between August 8, 2003 and the fall rains in October within primarily roadless areas. Suppression efforts were minimal and conducted only to "herd" the fire and keep it within the roadless areas. The Upper Twin and Rock Garden fires were approved Wildland Fire Use (WFU) fires and were only monitored. The Pleasant and Rhodes fires were field reviewed during September and October. The wildfires exhibited mixed severity mosaic burn patterns with the hottest burn areas located on ridges or dry slopes. Impacts of the reduced streamside cover and the resultant effects on stream temperatures during the summer months have not been quantified, but some increases in summer stream temperatures will most likely occur in the smaller tributaries. However, impacts to the main fish-bearing streams, such as Cayuse Creek, Silver Creek and Mink Creek, are expected to be minimal and non-measurable. Effects to the mainstem North Fork Clearwater River are most likely nonexistent. Sediment impacts to the fish-bearing streams should be relatively small and localized, and the impacts are expected to dissipate during high spring runoff in 2004.

Following the Pleasant Fire which burned approximately 3,200 acres in the upper Cayuse Creek drainage during 2003, the Burned Area Emergency Response (BAER) review conducted by the Forest found 18 culverts along USFS road #581 (Toboggan Ridge Road) that were undersized within the burned area. Several storm events during September caused one culvert to plug and the perennial (non-fish bearing) stream to flow over the road prism. This culvert was replaced under the emergency funding in late September. The remaining culverts were providing adequate drainage and were not replaced during the late fall due to the worsening winter conditions. The BAER review noted that runoff from the burned area is expected to in-

crease during the next several years and the eighteen culverts identified during the review needed replacement during the summer 2004. Most of these culverts were installed when the road was constructed in the 1930's and were sized for marginal storm events (under 100 year events).

One natural event and one road-related event caused minor changes to the aquatic environment in the Skull Creek drainage. Several debris torrents occurred in the lower Skull Creek during a high precipitation event in the late fall of 2002. Most of these landslides and resultant debris torrents occurred in smaller drainages and caused no observable effects to fish bearing streams. Field review found one moderate sized debris torrent and one small landslide that affected USFS road # 252 and deposited unknown amounts of sediment and debris into fish bearing streams. The larger natural event started as a small slump which initiated a debris torrent in a smaller face drainage in lower Skull Creek. The impacts of the debris torrent occurred at the junction of USFS roads #252 and #710 and deposited a large amount of material each road and the flood plain. Field reviews in the spring of 2003 did not indicate any noticeable changes in substrate conditions in Skull Creek. The second event occurred on USFS road #252 in the Bim Creek drainage. The slide started adjacent to a older road and material slumped onto USFS road #252. Some sediment from this landslide moved across the road and flowed into a small tributary of Bim Creek. The impacts to Bim Creek were not evaluated.

The last event involved the debris jam washout and resultant substrate movement in the lower Elizabeth Creek drainage. Field reviews during the summer of 2003 indicated that a large debris jam located approximately 0.25 miles from the mouth of Elizabeth Creek was destabilized and substrate material stored above the structure released during high spring flows in 2003. Evidently the debris jam was an older structure that was burned during the Elizabeth Fire in 2000. After several spring flow events, the structure was eventually weakened. The substrate material from the debris jam and bank erosion associated with the wash out altered the habitat conditions in the lower 0.25 miles of Elizabeth Creek. The stream channel is expected to stabilize in the next year with habitat conditions improving over the next several years. Monitoring data regarding the evaluation of substrate conditions in Elizabeth Creek are presented in the *Riparian Areas* section of this report.

Besides these five natural events, no additional natural or anthropogenic events occurred in the USFS drainages within the North Fork Clearwater River watershed during 2003 that caused changes to the aquatic environment. Instream conditions and riparian conditions did not show any substantial changes due to climatic, spring stream flows, erosion (sedimentation due to surface and mass wasting events), and management activities (i.e. roads, vegetative treatments, mining and grazing). Various field reviews and monitoring activities have supported the conclusion that the habitat conditions are most likely similar to 1998-2002 conditions. Based on these assessments, the presence/absence and relative abundance of fish populations within the watershed are assumed to be similar to conditions observed during various surveys throughout the 1990's.

Watershed/Habitat Restoration: Due to budget constraints, no major watershed restoration projects (i.e. road decommissioning, culvert replacements) were completed in the North Fork Clearwater River drainage. Fisheries and engineering funds were used in a cooperative Forest effort in completing survey, NEPA and ESA consultation, and design work on several culvert replacement projects on Toboggan Creek, Jackknife Creek and Squaw Creek. The culvert on Toboggan Creek will be removed and replaced by a bridge in 2004. The Jackknife culvert will be replaced in 2004 to allow for fish passage.

Riparian Fencing: One temporary electric fence that was installed in 1996 around the sediment trap in the upper Elk Creek basin was maintained in 2003. This provided protection of the riparian vegetation and maintained the integrity of the sediment trap from stream bank alterations.

North Fork Clearwater River Tributaries: Due to budget constraints and fire restrictions, no new stream habitat and fish population surveys were completed by the Forest in 2003. However the Forest did continue the 1995-1996 flood monitoring project via contract and two substrate monitoring projects during 2003. The substrate-monitoring project in lower Moose Creek was continued by the Forest in 2003. In addition, stream channel and substrate conditions were monitored at permanent sites on several streams (upper North Fork Clearwater River, Elizabeth Creek, Lake Creek, Fourth of July Creek, Weitas Creek and Hemlock Creek). See **Riparian section** for more information.

The second year of the substrate-monitoring project in lower Moose Creek (mouth upstream to Little Moose Creek) was completed in 2003 to determine trends of sediment (% fines by depth) in westslope cutthroat trout spawning areas. The monitoring data will also help assess any impacts of small suction dredge mining which occurs upstream in Moose Creek, Independence Creek and Deadwood Creek. This monitoring consists of measuring the substrate particles that are collected by digging a core into the stream bottom at selected riffle and pool tail-out sites. Preliminary analysis of the data indicates that the percentage of sediment (fine sediment < 6.4 mm) within the substrate at the monitoring sites ranged between 23.0% and 18.7% fines for 2002 and 2003 respectively. The two-year average of approximately 20.9% fines is still above the desired condition of 12-14% fines for the "high fishable" Forest Plan standard for westslope cutthroat trout. Additional data is scheduled to be collected in 2004, 2005 and 2007.

As in 1997 and 1998, the Forest completed resurveys of habitat and substrate conditions on selected sensitive stream reaches within two streams that were affected by the 1995 floods.[7] Comparison of survey data collected prior to 1995-96 floods and during 2003 shows that the average cobble embeddedness levels at the two stream reaches in Orogrande Creek increased by 10 and 1 percent. In contrast, the stream reach in Isabella Creek showed average cobble embeddedness levels decreasing by from 36% to 18% between 1990 and 2003. The increases levels in the Orogrande Creek drainage most likely reflects the continued transport of the landslide material from the smaller tributaries into the mainstem reaches.

In addition to the two streams surveyed above, eight stream reaches within the Moose Creek drainage were re-surveyed via contract to determine changes in channel and habitat conditions between 1990 and 2003.[8] The monitoring data will also help assess any impacts of small suction dredge mining which occurs in these stream reaches in Moose Creek, Independence Creek and Deadwood Creek. Although the final report is not available at this time, the preliminary data analysis indicates that average cobble embeddedness levels in six reaches on the mainstem Moose Creek (downstream Deadwood Creek) fluctuated as three reaches showed slight decreases (1-8%) and three reaches showed slight increases (2-8%). The stream reaches on Deadwood Creek and Independence Creek both showed substantial increases as the average cobble embeddedness levels increased from 16% (1990) to 32% in both streams.

Mainstem North Fork Clearwater River: In 2002, the Forest continued the monitoring of substrate and pool conditions via contract to assess the effects of the 1995/96 floods on the fisheries habitat within the mainstem North Fork Clearwater River (Clearwater BioStudies Inc 2002).[9] Comparison of 2002 and 1998 data indicates that the substrate conditions have continued an improving trend from 1998 conditions (see *2002 Forest Monitoring Report* for more information). During 2003, the survey was completed with the collection of cobble embeddedness and surface fines data on five sensitive reaches on the mainstem North Fork Clearwater River (between Ermine Creek and Sprague Creek). Data analysis indicates that cobble embeddedness and surface fines varied substantially within and among the five monitoring sites.[10] However, the average cobble embeddedness levels were much higher than anticipated for the mainstem North Fork Clearwater River. Although the five reaches were selected to represent the most sensitive in terms of sediment deposition (low gradient stream segments with smaller substrate material) and sediment conditions expected to be generally higher, the mean values for the weighted cobble embeddedness for the five sites (range 25.1-84.4%) were higher than the desired condition of less than 25% cobble embeddedness for the "no effect" Forest Plan standard for westslope cutthroat trout.

The survey also noted that the most impacted stream reach within the North Fork Clearwater River in terms of sediment was at the site three miles downstream of Orogrande Creek (site 2).[11] The average cobble embeddedness and surface fines levels were 84.4% and 35.9% respectively. Since the site two miles upstream of Orogrande Creek (site 1) showed substrate conditions that were substantially better (33.7% and 8.0%),

[7] Clearwater BioStudies Inc. 2004. Preliminary data - summary of flood resurvey data.

[8] Clearwater BioStudies Inc. 2004. Preliminary data - summary of flood resurvey data.

[9] Clearwater BioStudies Inc. 2002. Draft data summaries. Residual pool depths, pool volumes, and particle size distributions of riffles in the lower North Fork Clearwater River, North Fork Ranger District, Summer 2002. Clearwater National Forest, Orofino, Idaho.

[10] Clearwater BioStudies Inc. 2004. Sediment sampling on the North Fork Clearwater River. Technical memorandum. March 30, 2004. Clearwater National Forest, Orofino, Idaho.

[11] Clearwater BioStudies Inc. 2004. Sediment sampling on the North Fork Clearwater River. Technical memorandum. March 30, 2004. Clearwater National Forest, Orofino, Idaho.

the majority of the sedimentation sources for site 2 and the downstream three sites are most likely located in the Orogrande Creek drainage. Additional surveys are planned for 2005 and 2007 to determine any trends.

Water Temperature Monitoring - North Fork Clearwater River Drainage: The Forest have been collecting water temperature data from 1992 to 2002 to determine temperature problems and prioritize riparian recovery efforts. Due to migration barrier at Dworshak Dam, streams within the Forest's boundary are considered non-anadromous (no potential for steelhead trout or spring chinook salmon); only water quality and habitat conditions related to resident fish (i.e. westslope cutthroat trout and bull trout) were analyzed.

In 2003, stream temperatures were monitored at 133 sites on 118 streams within the North Fork Clearwater River drainage. Temperature data for 20 of these sites are not available (instruments still instream, missing units, equipment failures, or exposed units prevented data collection). Comparison of the 2003 stream temperature data from the 113 monitoring sites on the 103 streams with available data with the desired maximum temperatures as defined for the appropriate standards in the Forest Plan Forest Plan revealed that:

1. The desired westslope cutthroat trout rearing temperature of 13°C (no effect) was monitored at ten streams. The standard was met at Birch Creek and Collins Creek. The standard was not met at any of the three sites on mainstem North Fork Clearwater River. Other streams monitored that are designated with a "no effect" standard, Toboggan Creek and Elizabeth Creek also did not meet the 13°C. In 47 out of 75 streams monitored with a "high fishable" standard, the desired temperature of 16°C (high fishable). In addition, five sites (Fisher Creek, Long Creek (upstream Short Creek), Meadow Creek, Spray Creek and Station Creek) exceeded the standard by five days or less.

2. The desired westslope cutthroat trout rearing temperature of 18°C (moderate fishable) was met at seven streams out of the eight streams monitored with a "moderate fishable" standard while the desired temperature of 20°C (low fishable) was met at 12 streams out of the 13 streams monitored with a "low fishable" standard.

3. The desired brook trout rearing temperature of 17°C (high fishable) was met at two streams, Johnson Creek and the West Fork Elk Creek. The other stream monitored for this standard, Elk Creek (upstream the town of Elk River) exceeded the standard. In addition, a temperature of 20°C (low fishable) was met at two streams, Oviatt Creek and Partridge Creek. The other stream monitored for this standard, Long Meadow Creek exceeded the standard.

Overall, water temperatures of 101 of 103 streams (with monitoring data) within the North Fork Clearwater River drainage were under the State standard for cold-water biota; water temperatures did not exceed the daily maximum of 22°C and the maximum daily average of 19°C. The temperature data included the lower mainstem North Fork Clearwater River; monitoring data showed that two sites on the mainstem North Fork Clearwater River with data available (downstream Beaver Creek and upstream Orogrande Creek) and Orogrande Creek (mouth) did not meet the State cold-water biota standard. The State standard of 13°C for the spring period for westslope cutthroat trout was met at ten streams (Cache Creek, Birch Creek, Collins Creek, Jap Creek, Laundry Creek, Niagara Gulch, Placer Creek, Shell Creek, Shake Creek and Slate Creek). Short Creek exceeded the standard for four days. None of the streams monitored met the bull trout maximum rearing temperature of 10°C (consecutive seven-day average of daily maximums during June-September) that has been promulgated by EPA as a final rule for water quality standards.

Fish Population Monitoring - North Fork Clearwater River Drainage: Due to budget constraints, fish population monitoring stations were only monitored via snorkeling at four sites in the upper Cayuse Creek in conjunction the Idaho Department of Fish & Game (IDFG) and US Forest Service (USFS) bull trout study. No bull trout were observed at the four permanent monitoring sites; however spot checks upstream of the monitoring area documented two juvenile bull trout. IDFG also conducted fish population monitoring via snorkeling 25 sites in nine streams (Isabella Creek, Beaver Creek, Collins Creek, Skull Creek, Quartz Creek, Orogrande Creek, French Creek, Little Moose Creek, and Ruby Creek); bull trout were found in Isabella Creek, Quartz Creek, and Skull Creek.

Bull trout spawning surveys were conducted on 14 streams within the North Fork Clearwater River drainage. Approximately 27 miles of stream within the upper North Fork Clearwater River, Moose Creek, Skull Creek

and Isabella Creek drainages were surveyed by the Forest and IDFG during the spawning period of September through early October. The streams included: Isabella Creek, Skull Creek, upper North Fork Clearwater River, Moose Creek, Swamp Creek, Osier Creek, Lake Creek, Long Creek, Bostonian Creek, Niagara Gulch, Placer Creek, Hidden Creek, Pollock Creek and Vanderbilt Creek. Bull trout spawning (72 redds) was documented in ten of the 10 streams. As in 2001-2002, the surveys found major concentrations of fluvial or adfluvial bull trout spawning activity in the Lake Creek and Vanderbilt Creek drainages. Multiple surveys on these streams and other potential bull trout streams are scheduled for survey in 2004.

As part of their ongoing monitoring program, personnel from the IDFG conducted fish population monitoring via snorkeling and creel census activities within the mainstem North Fork Clearwater River and selected tributaries.

North Fork Clearwater River Bull Trout Studies: In 2003, the IDFG and the Forest continued a partnership project regarding bull trout studies within the North Fork Clearwater River subbasin. The five year project is primarily designed to determine the movements of bull trout collected from Dworshak Reservoir. In 2003, the IDFG marked and monitored movements of 150 adult bull trout. The Forest assisted in conducting fish population monitoring and spawning ground surveys. Genetic information from tissue samples from bull trout were processed and analyzed by the University of Idaho. In 2004, IDFG will continue to work with the Forest and U.S. Corps of Engineers in the last year of this partnership project. Besides validating known spawning areas, the tracking of over 575 adult bull trout during the past four years has identified other streams where bull trout migration and spawning are occurring in the North Fork Clearwater River drainage. The IDFG has published several reports summarizing the information collected during the past four years; contact the IDFG Lewiston's Office for more information.

PALOUSE RIVER DRAINAGE

Watershed Status: No natural or anthropogenic events occurred on USFS lands in the Palouse River watershed during 2003 that caused changes to the aquatic environment. Instream conditions and riparian conditions did not show any substantial changes due to climatic, spring stream flows, erosion (sedimentation due to surface and mass wasting events), and management activities (i.e. roads and vegetative treatments). No major fires occurred in 2003. Various field reviews and monitoring activities have supported the conclusion that the habitat conditions for most drainages are most likely similar to 1998-2002 conditions. Monitoring efforts have shown some improvement and degradation in specific drainages that were impacted by the 1995/96 floods. Based on these assessments, the presence/absence and relative abundance of fish populations within the watershed are assumed similar to conditions observed during 1997-98 surveys.

Habitat Improvement - Palouse River Drainage: No major watershed restoration activities (i.e. road obliteration, new riparian fence construction, instream restoration projects) were scheduled in 2003.

Habitat Monitoring - Palouse River Drainage: Since the stream inventories of all fish-bearing streams within the Palouse River drainage on National Forest System lands have been completed within the last 10 years, no additional habitat surveys were scheduled for 2003.

Water Temperature Monitoring - Palouse River Drainage: Stream temperatures were monitored throughout the summer at 11 sites on 10 streams within the Palouse River drainage to evaluate habitat conditions for brook trout and rainbow trout. The upper Palouse River is not accessible to anadromous fish. In addition, bull trout and westslope cutthroat trout have not been observed in the upper Palouse River drainage. Comparison of the 2003 stream temperature data from the 11 baseline sites and the desired maximum temperatures as defined for the "low fishable" standard in the Forest Plan revealed that:

1. The desired rainbow trout and brook trout rearing temperature of 20°C was met at six sites (Big Creek, Big Sand Creek, Little Sand Creek, Gold Creek, Palouse River (at gage and downstream Wagner Gulch) and Strychnine Creek. However, Mannering Creek, Meadow Creek (downstream Blakes Fork Creek) and North Fork Palouse River exceeded the standard for three days or less.

2. The Palouse River (upstream Laird Park) and East Fork Meadow Creek exceeded the standard.

Overall, water temperatures at eight streams were under the State standard for cold-water biota; water temperatures did not exceed the daily maximum of 22°C and the maximum daily average of 19°C. The

Mannering Creek and East Fork Meadow Creek exceeded the standard for one and ten days respectively. The State standard of 13°C for the spring spawning periods for rainbow trout was not met at any site. Water temperatures were not recorded throughout the fall spawning period for brook trout. However, the stream temperatures are most likely below the State standard of 13°C.

Fish Population Monitoring - Palouse River Drainage: Due to the absence of sensitive fish species (i.e. steelhead trout, westslope cutthroat trout, bull trout, spring chinook salmon), fish population monitoring is not scheduled on an annual basis within the Palouse River drainage; no monitoring was conducted in 2003.