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4. Subbasin Assessment – Summary of Past and Present Pollution Control Efforts

4.1 Point Source Control Efforts

Of the point sources of pollution in the SF CWR Subbasin, the community WWTPs are among the largest in the subbasin, however they have a relatively strong record for treatment before discharging to waters of the subbasin. Other point sources of interest are wood products industrial plants and recreational suction dredge mining operations.

Wastewater Treatment Facilities

Red River

The Red River Ranger Station is located near the confluence of the South Fork Red River and the main stem of Red River. The WWTP, operated by the NPNF, consists of secondary treatment and chlorine disinfection. Sewage flows to a waste stabilization pond followed by passage through a sand filter for treatment. This is followed by chlorine disinfection prior to release into the South Fork Red River at the confluence with Red River proper (USEPA 2002e). Exceedances listed in discharge monitoring reports between 1995 and 2000, according to the USEPA fact sheet for plans to reissue the NPDES permit to the Red River Ranger Station (USEPA 2002e), included exceedances of the following parameters:

- BOD (1995-2000)
- TSS (1995-1997, 1999)
- Fecal coliform (1995)
- pH (1995)

The NPDES permit for the Red River Ranger Station WWTP expired on December 31, 1978, and was administratively extended on October 29, 1979. A renewal application was received by USEPA on June 25, 2001, and USEPA reissued the permit on June 26, 2002. The new permit includes the stipulation that the permittee develop a facility plan and schedule in the event that average annual input exceeds capacity for three consecutive months. More information is available on the Region 10 USEPA Web site at www.epa.gov/r10earth (USEPA 2002e).

Elk City

Elk City is located in the American River watershed. The Elk City Water and Sewer Association municipal WWTP uses treatment equivalent to secondary treatment and chlorine disinfection. The facility collects wastewater through a gravity sewer collection system and treats it in an aerated waste stabilization pond. It is then disinfected using chlorine prior to release into Elk Creek, a tributary of the American River (USEPA 2002d). Exceedances listed in discharge monitoring reports between 1995 and 2000, according to the USEPA fact

sheet for plans to reissue the NPDES permit to the Elk City Water and Sewer Association (USEPA 2002d), included exceedances of the following parameters:

- BOD (1995, 1998)
- Total residual chlorine (1995-1998)
- BOD percent removal (1995-2000)
- pH (1996-1998)

The NPDES permit for the Elk City Water and Sewer Association expired on May 31, 1993. The initial renewal application was received by USEPA in December 1992. An updated renewal application was filed on July 9, 2001. The USEPA reissued the permit on June 26, 2002. The new permit includes the stipulation that the permittee develop a facility plan and schedule in the event that average annual values exceed capacity for three consecutive months. More information can be obtained by visiting the Region 10 USEPA Web site at www.epa.gov/r10earth (USEPA 2002d).

Grangeville

The city of Grangeville operates a municipal WWTP that discharges into Threemile Creek. Originally the system consisted of a trickling filter and primary clarifier with anaerobic digestion, followed by drying beds and treatment in a single chlorine tank before discharge. This system was ineffective, as high flows in the spring often overloaded the system.

In 1989, the City of Grangeville upgraded with a new $3 million system designed to handle 0.88 million gallons per day (MGD). The new system consists of activated sludge and a boat clarifier inside oxidation ditches, followed by a clear water weir and three chlorine contact tanks. The treated effluent is discharged into Threemile Creek via an underground pipe (Klecha 2002). Inspections in 1996 (USEPA 1997) and 2002 (DEQ 2003) found the facility to be generally in compliance. An NPDES permit was issued to Grangeville on December 30, 1987, and expired on December 29, 1992. The USEPA will initiate reissuance of the permit once the SF CWR TMDL is complete.

Stites

The City of Stites is located on the main stem SF CWR. The municipal WWTP for the City of Stites uses treatment equivalent to secondary treatment and chlorine disinfection. Sewage is moved through a pump station to a lagoon cell where it is treated. It then undergoes chlorine disinfection before release into the SF CWR (USEPA 2002b). Exceedances listed in discharge monitoring reports between 1995 and 2000, according to the USEPA fact sheet for plans to reissue an NPDES permit to the City of Stites (USEPA 2002b), included exceedances of the following parameters:

- BOD (1995)
- TSS (1995-2000)
- Fecal coliform (1995-1999)
- BOD percent removal (1995-1999)

The NPDES permit for the City of Stites municipal WWTP expired on January 9, 1991. The renewal application was received by USEPA on July 31, 2001. Upon completing an anti-degradation analysis, USEPA concluded that continued discharge will not reduce water quality beyond the mixing zone and has proposed to reissue the permit. The permit draft includes the stipulation that the permittee develop a facility plan and schedule in the event that average annual values exceed the capacity for three consecutive months. More information can be obtained by visiting the Region 10 USEPA Web site at www.epa.gov/r10earth (USEPA 2002b).

Terry Nab, the engineer composing the facility plan for the City of Stites, is recommending as part of this plan that the City of Stites connect with the City of Kooskia's WWTP. The City of Stites recently applied for financial assistance with the U.S. Department of Agriculture's Rural Utilities Service, which has prepared an Environmental Assessment evaluating the effects of connecting the City of Stites to the City of Kooskia's sewage system. The proposed project would additionally make improvements to the City of Stites' sewage collection system. The comment period required under the National Environmental Policy Act (NEPA) process ended July 19, 2002. As of this time, the cities have decided to move forward with project, but have not yet begun construction.

Clearwater Forest Industries

Clearwater Forest Industries is located off State Highway 12 between Stites and Kooskia. The timber processing operation has a total of seven outfalls discharging to the main stem SF CWR. Outfalls 1, 3, and 7 combine wastewater from log deck sprinkling during April through October, and storm water. Outfalls 2, 5, and 6 are for storm water only. Outfall 4 is for a combination of storm water and boiler blowdown with recycled kiln condensate. Treatment of outfalls 3, 4, and 7 is provided through the use of settling ponds, while outfalls 1, 2, 5, and 6 receive no treatment prior to release to the SF CWR (USEPA 2002c).

An application for an NPDES permit was received by USEPA on March 29, 1996. The facility was contacted in August 2001 to determine if there were any updates in the application. The USEPA issued the permit on June 26, 2002. The permit includes the stipulation that the permittee develop a facility plan and schedule in the event that average annual values exceed capacity for three consecutive months. More information can be obtained by visiting the Region 10 USEPA Web site at www.epa.gov/r10earth (USEPA 2002c).

Kooskia

The City of Kooskia is located on the main stem SF CWR near the confluence with the Middle Fork Clearwater River. The City of Kooskia operates a municipal WWTP that uses treatment equivalent to secondary treatment and disinfection. Sewage is treated in a two-cell aerated lagoon, followed by a settling contact chamber. Wastewater is then disinfected by chlorination prior to discharge to a polishing ditch prior to release into the SF CWR at river mile 0.5 (USEPA 2002a). Exceedances listed in discharge monitoring reports between 1995

and 2000, according to the USEPA fact sheet for plans to reissue an NPDES permit to the City of Kooskia (USEPA 2002a), included exceedances of the following parameters:

- TSS (1995-1999)
- Fecal coliform (1995-2000)
- BOD percent removal (1995-1999)
- pH (1996)

The NPDES permit for the City of Kooskia expired on March 20, 1991. A renewal application was received by USEPA on May 24, 2001. Upon completing an anti-degradation analysis, USEPA concluded that continued discharge will not reduce water quality beyond the mixing zone in the SF CWR and reissued the permit on June 26, 2002. The new permit includes the stipulation that the permittee develop a facility plan and schedule in the event that average annual values exceed capacity for three consecutive months. More information is available on the Region 10 USEPA Web site at www.epa.gov/r10earth (USEPA 2002a).

Suction Dredge Mining

The IDWR regulates stream channel alterations, including suction dredge mining, through the Idaho Stream Channel Protection Act. Under this statute, dredge miners are required to obtain a permit from IDWR. Commercial operations must file a joint application with both the IDWR and the ACOE (IDWR 2002). Within the next two years, USEPA intends to develop a general NPDES permit for the suction dredge industry.

Under the IDWR general permit, suction dredging is only allowed in the SF CWR Subbasin from July 15 – August 15 each year, in order to avoid periods when chinook, cutthroat, and steelhead are spawning and eggs are incubating. The USEPA reviewed the IDWR general permit for suction dredge mines in 1998, and found that it adequately addressed environmental concerns from these operations (USEPA 1998).

Although there is currently no limit on the number of facilities that can operate in the basin under the general permit, the actual number of facilities that have filed to operate in recent years is limited: 14 in 2000, 7 in 2001, and 8 in 2002 (IDWR 2002).

The USFS mining regulations in effect since 1974 have reduced mining impacts, as have environmental laws passed in the 1970s and 1980s and the NPNF forest plan, which was approved in 1987. The USFS currently prohibits dredges in protected rivers and national recreation areas (IDWR 2002). The USFS began tracking, inspecting, and monitoring suction dredges on the NPNF in 1995. The focus has been primarily on recreational dredging (5” or less diameter nozzle and no more than 15 horsepower equipment), but commercial dredging has also been tracked to some extent.

The NPNF requires a notice of intent from recreational suction dredgers stating information on dates and locations of proposed mining. The NPNF inspects these operations and conducts instream monitoring seasonally. Non-recreational operators are required to file a plan of operations as well (DeRito 2000).

The monitoring system for dredge mining is still being refined. Turbidity data that have been processed to date show turbidity levels are remaining below state WQS. Percent fines data have been difficult to interpret due to a lack of pre-dredge data, limited sample numbers, and little relative information (DeRito 2000). Pre-dredge data collection would make this process more effective in the future.

4.2 Nonpoint Source Control Efforts

Nonpoint source pollution control efforts in the SF CWR Subbasin are numerous and widespread. For the most part, they come from the implementation of standardized BMPs for forestry and agriculture. Several specially funded projects have been implemented in the subbasin since passage of the CWA.

Agriculture

State, tribal, federal, and private lands in the subbasin have been cultivated and grazed since the mid-1800s (USFS 1998). Records are kept only on current contracts with private landowners for land enrolled in the Conservation Reserve Program through the Farm Services Agency. Currently, the records show contracts as early as 1992 and extending through 2011. Land enrolled in the program in the SF CWR drainage as a whole totals 1,743.7 acres, which includes the Cottonwood Creek watershed. Most of the land is enrolled as permanent wildlife habitat. There are some lands under contract to maintain existing vegetative cover, others to maintain permanent grasses and lagoons, some to provide wildlife food plots, two to maintain shallow water areas, one to establish a shelter belt (windbreak adjacent to a stream), and one to establish a tree planting plot (Sickels 2002).

The NRCS in Grangeville has treated, or is currently treating, approximately 320 acres of cropland, pasture, and hay land under the NRCS Environmental Quality Incentives Program in the SF CWR Subbasin. The program encourages using no-till agriculture, planting grass waterways, and seeding pastures and hay lands (Spencer 2002). Cottonwood Creek has had a significant amount of land treated through Cottonwood Creek TMDL implementation efforts, including a large number of acres seeded using no-till/direct-seed methods and several acres managed under nutrient management plans. An off-site water facility and some filter strips have also been installed. Additionally, more areas are expected to receive treatment in the near future. For more information, refer to the *Cottonwood Creek TMDL Implementation Plan* available at the NRCS office in Grangeville.

The NPT Land Services Division is responsible for writing conservation plans of operations for agriculture leases on Indian-owned land, based on wise land use practices and owner input. The conservation plans of operations requirements include residue management and specific tilling requirements. Residue is not to be burned and, except for harvested grass seed, must be returned to the soil. Residue cannot be grazed or baled without authorization. Residue requirements are additionally in place specifying percent coverage for various low and high-residue crops. Tilling and seeding operations are to be performed across slope or as close as possible to contour. These operations must be performed parallel to diversions or terraces, where present (NPT 2002a).

Grazing laws in the NPNF were enacted when the forest was established in 1908. Currently, there are 12 grazing allotments active in the subbasin (USFS 1998).

Forestry

Timber harvest in the SF CWR Subbasin began in the mid- to late-1800s in association with mining activities. Commercial harvest began in the 1940s. From this time until the 1960s, harvest was largely selective, removing only high-value species. At this time ground skidding, even on steep slopes, was not considered problematic. As a result, skid trail density was higher than that of the present (USFS 1998). Since 1970, cable yarding has been required on steep slopes, reducing the amount of skid trails necessary. In addition, it has become common practice to obliterate these trails when they are no longer necessary. Fuels abatement practices and site preparation activities have also been changed to reduce the amount of soil disturbances on harvested areas. In the 1960s and 1970s, clearcutting became the dominant harvest method, but decreased in the mid-1980s (USFS 1998).

In 1974, rules and regulations were adopted under the FPA, giving oversight of all forest practices on forest land to the state of Idaho. Inspections are made by the IDL and the federal land management agencies to ensure compliance (USFS 1998). The NPNF, through the federal Pacific Anadromous Fish Strategy (PACFISH), generally does not permit timber harvest in riparian habitat conservation areas and other areas where the activity would pose an unacceptable risk to aquatic or riparian habitat (USFS and BLM 1995).

The NPT's Forest Management Plan (1999) outlines BMPs that are to be implemented on tribal-owned lands during harvest activities. These include planting riparian buffer strips, following yarding practice requirements, following road design stipulations, and allowing revegetation time prior to beginning grazing activities (NPT 1999).

4.3 Watershed Improvement Projects

The USFS administers approximately two-thirds of the land in the SF CWR Subbasin as the NPNF. The NPNF, in conjunction with the BLM and the NPT, has been involved in numerous watershed improvement activities in the SF CWR Subbasin. Pollution control efforts began in the 1980s through a habitat improvement project funded by the Bonneville Power Administration (BPA). The BPA and the NPNF entered into an agreement in 1984 (Project 84-5) to improve fish habitat in accordance with the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Siddall 1992). The act stipulated mitigation and enhancement of fish populations affected by hydroelectric power development in the Pacific Northwest. The original agreement included plans to improve the Crooked and Red Rivers. A series of amendments subsequently resulted in the plan including improvements in four glory holes. These massive holes left in hillsides from hydraulic mining from 1852 through the 1950s exposed large areas of bare soil on extremely steep slopes. Some efforts were executed in an attempt to reduce erosion prior to Project 84-5 at some of these glory holes, but they were largely ineffective.

The USFS and BLM produced a land management plan, PACFISH (USFS and BLM 1995), in response to the declining salmon populations in the subbasin and the listing of Snake River fall chinook (*Oncorhynchus tshawhytscha*) as threatened in the Clearwater Basin under the ESA of 1973 (Federal Register 1992). The plan's strategies and goals aim to slow degradation and begin the restoration of habitat for anadromous fish. The plan sets forth management measures for proposed and new activities involving resource management and land use decisions that pose an unacceptable risk to anadromous fish. The strategy is applied to all proposed projects (including recreation, mining, timber, roads, and grazing management projects) required to comply with the ESA, NEPA, the National Forest Management Act, the Federal Land Policy and Management Act, and any other applicable environmental law. It additionally outlined measures for restoration of watersheds and fish and wildlife habitat within anadromous fish habitat. This was adopted as an interim plan prior to the decisions resulting from the Interior Columbia Basin Ecosystem Management Project (ICBEMP) (USFS and BLM 2000). The PACFISH policy is still in place.

In 1994, BLM and USFS, in order to determine the status of the whole Columbia Basin ecosystem upstream from The Dalles, OR, commenced the ICBEMP (USFS and BLM 2000). Findings from this project were considered for the *South Fork Clearwater River Landscape Assessment* completed by the NPNF in 1998 (USFS 1998). This document characterized both social and ecological conditions within the subbasin on which to base forest management decisions. It identified water quality as one of the key issues to be addressed. Resulting recommendations from this document included road maintenance and fish habitat conservation. Road decommissioning activities in the NPNF increased after 1995, and currently forest improvements focus on road decommissioning and instream improvements (Gerhardt 2002b).

The NPNF released the *South Fork Clearwater River Biological Assessment* (BA) in April 1999 (USFS 1999). In accordance with the ESA, this assessment presents the existing conditions in the subbasin using the best available data. Screening of ongoing and proposed activities was presented on a watershed basis. The BA is used to assess all ongoing and proposed activities that affect listed species, including Snake River steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), and fall chinook salmon (*O. tshawhytscha*) (USFS 1999). The NPNF conducts regular monitoring of forest practices. The results are reported annually in forest plan monitoring and evaluation reports.

The Clinton administration's Roadless Area Conservation Rule (USFS 2002b), issued on January 12, 2001, established prohibitions on road construction and reconstruction and timber harvest in inventoried roadless areas on National Forest System lands. In the NPNF, 127,000 acres of current inventoried roadless areas (6% of the NPNF) are potentially affected by this rule (USFS 2002b).

The NPT Fisheries Watershed Division has constructed exclosures in meadows and riparian areas, implemented channel alignment improvements, and performed plantings on stream banks and meadows throughout the watershed. Monitoring of these projects has been on-going to assess effectiveness. Project areas have included Red River, Newsome Creek, Johns

Creek, McComas Meadows (Meadow Creek), and Mill Creek (McRoberts 2002). The NPT is currently planning road decommissioning in several watersheds in the subbasin.

Specific pollution control activities are presented in the following text by watershed. In addition to these specific projects, the BA presents road and trail maintenance and stabilization activities as well as outfitter, timber sale, and grazing allotment controls as they contribute to the mitigation efforts throughout the SF CWR Subbasin (USFS 1999).

Red River

Road building, logging, grazing, and dredge mining have heavily impacted the Red River drainage. Much of the riparian vegetation has been eliminated and the river channel has been straightened as a result of these activities. Project 84-5, a product of the agreement between BPA and the NPNF in 1984, involved the installation of instream structures, re-establishment of vegetation, installation of streamside fencing to alleviate grazing impacts, and stabilization of areas previously disturbed by dredging activities. From 1985 to 1989, six sediment traps were constructed in the Red River drainage to reduce sediment reaching fish rearing and spawning areas (Siddall 1992).

The Cal-Idaho glory hole, the largest in the SF CWR Subbasin, is located on private land (Stewart 2002). Runoff from this pit transports sediment to the Red River. In 1990, as part of Project 84-5, a rock crib check dam to trap sediment was installed in a small canyon that drains the majority of the glory hole (Siddall 1992). The dam was not effective, as sediment was deposited behind it shortly after installation (Gerhardt 2002c). Further projects focusing on the Cal-Idaho glory hole were discussed in the mid-1990s, but actions were not initiated. The NPNF had a completed design for a more elaborate trap at the outlet to Red River. The trap was to be constructed busing BPA funds, but the landowner did not grant permission (Gerhardt 2002c). Shearer Lumber started using the Cal-Idaho glory hole as a wood waste disposal site, covering the eroding banks with wood waste. This, in fact, has been successful in halting the erosion. Unfortunately, the owner of the site could not be convinced to continue with this operation (Wilhite 2002).

Many improvement activities had been complicated due to the large amount of degraded land being privately owned. There were difficulties in acquiring riparian easements and providing long-term maintenance of fence and instream structures throughout the execution of Project 84-5. Permission to perform work on private land was often delayed or not granted (Siddall 1992).

Activities in 1990 and 1991, however, focused on private land just below the confluence of the South Fork Red River and the Red River proper. These activities were collectively known as the “Mullins Project,” named after the private landowner, E. Mullins. The BPA-funded project was largely the result of cooperation from the Idaho National Guard, the Red River Ranger District, Shearer Lumber Company, Kelly Creek Flycasters, Potlatch Corporation, IDFG, and the U.S. Fish and Wildlife Service. Within this meadow area of approximately 0.75 mile in stream length, the channel was realigned, banks stabilized, and width to depth ratio decreased. Instream structures were also installed, and riparian

vegetation was planted. As of April 1992, the project was considered successful (Siddall 1992).

In 1993, the BPA, the National Fish and Wildlife Foundation, IDFG, Rocky Mountain Elk Foundation, and Trout Unlimited purchased a 314-acre parcel in the lower Red River drainage. This parcel became the Red River Wildlife Management Area and was deeded to IDFG to manage with the goal of restoring the lower Red River Meadow ecosystem to high quality habitat for bull trout (*Salvelinus confluentus*), steelhead trout (*Oncorhynchus mykiss*), chinook salmon (*Oncorhynchus tshawytscha*), and other fish species (LRK Communications 2001). Project planning began in 1994 and implementation began in 1996. Monitoring was initiated in 1997 to assess the effectiveness of the project. As of 2001, channel length in the project area had been increased by 5,045 feet compared to pre-restoration conditions. Slope had been decreased by 40 percent, and sinuosity had been increased by 60 percent. These efforts have resulted in a decreased water velocity at bankfull, alleviating areas of bank erosion. Channel width and depth characteristics have additionally been improved in the project area (LRK Communications 2001). More information on the project can be accessed at http://boise.uidaho.edu/hosted/redriver (LRK Communications 2001).

The 1999 NPNF BA summarized proposed activities that may have affects on the Red River drainage (USFS 1999). Included in the summary was a discussion of the proposed Hercules Mine reclamation and Soda Creek 1 and 2 Rock Pit restorations. The Hercules Mine, a lode gold mine, is located in the Ditch Creek drainage. Reclamation would involve removing trash and mining structures, breaking-up the road surface over roughly 20 acres, and seeding trees. Reclamation of Soda Creek 1 and 2 Rock Pits would include reshaping pits, replacing topsoil, creating water bars, and planting vegetation to reduce erosion (USFS 1999). Neither of these projects started prior to the drafting of this document (USFS 2002a). Improvements were made in the Bridge Creek Campground near Red River Hot Springs to alleviate sediment input and fish harassment as recommended by the 1999 BA (USFS 1999). Campsites adjacent to a tributary of Bridge Creek were blocked and tables removed to decrease traffic in the area (Sherwood 2002).

In 2001, the NPT, in cooperation with the NPNF, initiated a road and culvert inventory, which will be used to develop a transportation plan and prioritize upgrades in the watershed (McRoberts 2002).

Crooked River

The agreement between BPA and the NPNF (Project 84-5) for the Crooked River included, among others, goals of improving fish and riparian habitat. The project area extended from the confluence with the SF CWR to Fivemile Creek. Primary focus was placed on riparian revegetation, creation of floodplains where tailings piles had confined flow, and cover installation in the existing channel. Bank stabilization also occurred in areas where sharp bends in the channel had caused unstable and eroding banks (Siddall 1992).

The NPNF's 1999 BA summarized projects with potential watershed affects in the Crooked River drainage (USFS 1999). According to the BA, drilling exploration (Petsite III mine

exploration) and resulting road construction (approximately 2.5 miles of road) occurred southeast of the Old Orogrande town site in 1996 and 1997. Some restoration occurred following these activities (USFS 1999). Three additional planned restoration projects (two road obliterations, one road closure, and some fish habitat structures in Crooked River) were not completed.

The NPNF and DEQ are working with the proponent of the Golden Eagle Mine, which was established in 1974, to minimize potential watershed affects. The only impact from this mine at the time of the BA was a road that was to be repaired by the end of the 2000 field season by the NPNF (USFS 1999).

American River

Elk City is located in the American River watershed. The BLM administers approximately 14,000 acres of land in the SF CWR Subbasin, primarily in the Elk City township. In the mid-1990s, the BLM prepared an aquatic habitat management plan for fish-bearing streams in the Elk City township. Activities outlined in the plan include riparian and wetland restoration, installation of instream fish habitat structures, relocation of stream channels, and construction of rearing ponds and channels (USFS 1999). Activities have been focused primarily on the dredged areas of American River. Implementation has been slowed by issues arising with mining claims. To date, the plan is roughly 30 percent implemented (Johnson 2002b). The BLM has recently closed problem roads under its jurisdiction to motorized vehicles in an effort to reduce erosion. The BLM has made road improvements, such as culvert removal and replacement, and is currently in the process of finalizing plans to further survey and improve existing roads (Johnson 2002b).

In addition to road closures and improvements, BLM has been involved with riparian exclosures and stream channel restoration efforts throughout the watershed. Instream structures and some riparian plantings have been the primary focus of restoration efforts. A total of 5 miles of instream structures/improvements have been completed on the American River by BLM. Approximately 0.3 miles of the East Fork American River have received improvements (Johnson 2002b). Grazing plans have been developed to reduce grazing impacts along stream banks and include restrictions on seasonal use, standards for utilization, and riparian grazing restricitons. Streams with overgrazing problems, including Elk Creek and Big Elk Creek, have had riparian exclosures constructed. The BLM Elk Creek and Big Elk Creek riparian pasture exclosures have been put in place for a total of 1 mile in stream length (Johnson 2002b). Section 7 ESA consultations with NMFS have been completed for all BLM grazing allotments (Johnson 2002b).

Newsome Creek

The Haysfork glory hole is a result of hydraulic mining activities in the early 1900s. This glory hole has contributed high levels of sediment into the Newsome Creek system. Efforts to rehabilitate the area began in the mid-1980s and continue today. Efforts in the mid-1980s proved ineffective, as slope failure returned the pit to the steep-sloped condition that had existed prior to rehabilitation. The glory hole was scheduled for work under the Project 84-5,

but following concerns from contractors, engineers, and hydrologists, activities did not commence until 1991. At this time, the top of the glory hole was seeded with grass and fertilized. The drainage system in the hole was improved and the area was lined with erosion control material. Existing sediment traps were emptied on the stream side of the hole, and a third trap was installed above the two existing traps (Siddall 1992). In 1997, a large settling pond with a 40-year storage capacity was created in the floodplain of Newsome Creek in an effort to reduce sediment input from the glory hole (USFS 1999).

In addition to these efforts, the NPT, in collaboration with the NPNF, has set the goal of decommissioning approximately 7 miles of roads in the Newsome Creek drainage and is initiating a feasibility study to determine the destiny of the dredge mine tailings and their effect on the stream channel (McRoberts 2002).

Leggett Creek

Two projects were initiated in the Leggett Placer glory hole by the NPNF as part of Project 84-5. Trees and shrubs were planted in the glory hole in 1987, and a sediment trap was constructed on the stream draining it in 1988. Runoff was also diverted from Leggett Placer through a pond adjacent to Leggett Creek in 1988 (Siddall 1992).

There were not records of glory hole planting success as of 1991, and in his Project 84-5 report, Siddall stated that further planting would be ineffective (Siddall 1992). The sediment trap was reported to be 50 percent effective at best early on, delivering sediment to Leggett Creek in major storm events (Siddall 1992). Sediment is currently removed from the trap every year and relocated to a flat area near the mouth of Leggett Creek, where it is contoured and seeded. This has reportedly worked well (USFS 1999).

Johns Creek

The NPNF has rehabilitated several roads and trails and obliterated various roads in the Johns Creek watershed (USFS 1999). In addition, the 1999 BA outlined plans to stabilize a slide on Road 9429, although work had not begun as of 2002 (USFS 2002a).

The NPT Fisheries Watershed Division installed approximately 2.5 miles of fence in the Johns Creek watershed. The resulting exclosure protects approximately 1 mile of stream length along Johns Creek from the effects of grazing. This work was accomplished with funds from the National Atmospheric and Oceanic Administration's Pacific Coastal Salmon Recovery Fund (McRoberts 2002).

Meadow Creek

Fisher Placer activities utilized water from Meadow Creek for mining operations using a 4-mile flume. Since mining ended in 1918, some revegetation has occurred naturally in the Fisher Placer. Heavy erosion has prevented vegetative growth on the steep west and north sides of the glory hole, and erosion still occurs throughout the placer. From 1982 to 1987, seeding with grasses and clover took place along the slopes. This was successful in some

areas, but did not take hold in more heavily eroding areas. In 1988, BPA funds were used to plant trees on the slopes of the main glory hole as well as on two test plots to determine success. At 3.5 months, erosion was determined to be quite significant at both plots (Siddall 1992). Erosion of the slopes has continued, with significant movement in 2000. The glory hole is currently located on private land (Paradis 2002) in the Meadow Creek watershed on a hillside. It is not immediately adjacent to Meadow Creek or a tributary (Lewis 2002).

As a part of Project 84-5, a partial fish barrier was removed from Meadow Creek in 1986. Prior attempts had been made to modify barriers–once in the late 1970s using explosives and again in 1984 with further blasting. Both attempts were ineffective at improving passage. With annual maintenance efforts, though, the 1986 effort has proved successful (Siddall 1992).

The NPT Fisheries Watershed Division has been involved in fence installation, riparian and stream channel improvements, and road decommissioning activities in the Meadow Creek drainage since 1997 with funding from BPA and in conjunction with the NPNF. Fencing activities began in 1997 in McComas Meadows, protecting the area from the impacts of grazing. A total of approximately 600 acres is currently protected in this area. In addition, riparian plantings, channel redirection, and removal of a constructed ditch have further improved the habitat of Meadow Creek. Culvert replacements are planned for the watershed as is decommissioning of approximately 20 miles of roads (McRoberts 2002). The NPNF performed channel restoration activities on Swede Creek, a tributary of Meadow Creek, in 2001 (USFS 2002a).

A stabilization plan was developed for a large slide area near the mouth of Meadow Creek. The slide contributes large quantities of sediment to Meadow Creek and the SF CWR. The plan involves a relief ditch to partially drain ponds at the head of the slide, but has not yet been implemented (USFS 1999).

South Fork Main Stem

Watershed improvement recommendations for the SF CWR main stem are summarized in the 1999 NPNF BA (USFS 1999). These improvements include the obliteration and rehabilitation of roads and the removal of sediment from the Leggett Placer (mentioned previously). Additionally, the document recommended reclamation activities on a small portion of the Prospector Bunny Mine. Seeding and mulching activities were suggested to rehabilitate deep gullies and unstable slopes at this site (USFS 1999).

Road rehabilitation activities on the Fisher Placer Road and Road 279L were completed by the NPNF by 2001. These resulted in improved drainage and stabilized road surfaces, which will reduce erosion. In addition, Bully Creek Road rehabilitation activities were completed in 2001, resulting in road stabilization in an area that had experienced past failures and had the potential for a number of future ones. These failures had restricted access for maintenance and resulted in a number of plugged culverts. Areas disturbed during rehabilitation activities were reseeded and mulched (USFS 2002a).