Small-Scale Suction Dredging in Lolo Creek and Moose Creek

Draft Supplemental Environmental Impact Statement

Clearwater National Forest
Lochsa and North Fork Ranger Districts
Clearwater County and Idaho County

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Clearwater National Forest

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Abstract:

This Supplemental Environmental Impact Statement documents the analysis of three alternatives, including a "no action" alternative, that were developed for the Small-Scale Suction Dredging analysis. The Notice of Intent to prepare this document was published in the Federal Register on April 4, 2003, and the Draft Environmental Impact Statement was released in April 2004.

After reviewing the effects of Small-Scale Suction Dredging and the three alternatives, Alternative 3 was selected as the preferred alternative by the Deciding Officer. This alternative allows the Clearwater Forest's authorized Officers to approve, with no further National Environmental Policy Act (NEPA) analysis, a limited number of proposed Plans of Operations in specified reaches of Lolo, Moose, Independence, and Deadwood Creeks. Prior to approval, each suction dredge operator must have all pertinent Federal and State permits/certification, and agree to specific operating conditions and mitigation measures designed to protect threatened fish species and their habitat. Alternative 3 also includes stream bank stabilization and reclamation of the abandoned Lolo #5 mining claim.

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Executive Summary

The Clearwater National Forest (CNF) proposes to allow approval of proposed Plans of Operation in specified reaches of Lolo Creek and Moose Creek (including two tributaries, Independence Creek and Deadwood Creek). The Plan of Operations would include specified operating conditions (referred to as terms and conditions), design features and mitigation measures. Prior to approval, each suction dredge operator would have all pertinent Federal and State permits/certification, and agree to specific operating conditions and mitigation measures designed to protect threatened fish species and their habitat. The project also proposes stream bank stabilization and reclamation of the abandoned Lolo #5 mining claim

Proposed suction dredge mining areas are located in Lolo Creek, 14-17 miles southeast of Pierce, Idaho in portions of T34N, R6E, Section 5 and T35N, R6E, Sections 10, 16, 17, 20, 29 and 32, Clearwater and Idaho counties. They are also located in Moose Creek, 12 miles east of Kelly Forks Work Center in portions of T39N, R11E, Sections 4 and 9, T40N, R11E, Sections 29, 31, 32, 33, Clearwater County, Idaho.

Existing Conditions

Since the 1860s, placer gold mining has occurred in rivers and streams across the CNF. Four of the more productive streams, Lolo Creek, Moose Creek, and two Moose Creek tributaries, Independence and Deadwood Creeks have had sporadic mining activity over the years. With the rise of gold prices in the 1970s, these streams experienced a renewed interest in prospecting and exploration. It was also around this time that many prospectors started using suction dredges to explore and mine in stream gravels. There are 17 unpatented mining claims on Lolo Creek and 26 unpatented claims on Moose Creek. Ownership of the claims is shared by 18 potential suction dredge operators on Lolo Creek and 38 potential suction dredgers on Moose Creek. The number of operators who actually prospect varies from year to year; but this analysis covers a maximum of 56 operators in Lolo and Moose Creeks.

Lolo, Moose, Independence, and Deadwood Creeks (hereafter referred to as Lolo Creek and Moose Creek) are most frequently mined by part-time, small-scale operations using suction dredges with nozzles ranging from two to five inches in diameter and gasoline-powered pumps up to 15 horsepower motor. Claimant activity ranges from short-term recreational uses (one to two weeks with a campout every year) to subsistence mining by individuals who supplement their income by extracting gold from their respective claims.

Until the late 1990s, Lolo Creek and Moose Creek suction dredge miners, in accordance with Forest Service Regulations, notified the Forest of their activities through a notice of intent to operate. Miners are also required to apply for and obtain a 3804-A stream alteration permit from the Idaho Department of Water Resources. The permit includes a list of specific terms and conditions ("best management practices," or BMPs) for resource protection. National Forests in Idaho collectively agreed that operations that implemented the State's BMPs could operate in selected streams with minimal or no effect to fish and water quality.

In 1997, steelhead trout within the Snake River drainage were listed as a threatened species under the Endangered Species Act. In 1998, bull trout were also listed as a threatened species within the Snake River drainage. Steelhead occur in low densities in Lolo Creek, and bull trout occur in low densities in both Lolo Creek and Moose Creeks. Steelhead are not found in Moose Creek due to the downstream Dworshak Dam. Dworshak Dam is a migration barrier to anadromous fish.

After the 2001 mining season, the CNF initiated the process of consulting, under Section 7 of the Endangered Species Act, with National Oceanic and Atmospheric Administration Fisheries (NOAA) and U.S. Fish and Wildlife Service (USFWS) concerning the effects of small-scale suction dredging on these threatened species in Lolo Creek and Moose Creek. The Forest has not approved plans of operation for dredging in Lolo Creek or Moose Creek, and no dredging has occurred since the 2001 mining season.

In a 2008 Biological Assessment (BA) completed by the Forest for Lolo Creek, the determination was made that suction dredging was "likely to adversely affect" steelhead trout, but was "not likely to adversely affect" Lolo Creek bull trout. In a BA for Moose Creek, the Forest determined that suction dredging was "likely to adversely affect bull trout". In NOAAs 2009 Biological Opinion, they agreed with the determination on steelhead in Lolo Creek. In the USFWS 2008 Biological Opinion and 2008 letter of concurrence, they

agreed with the Forest Service determination as mentioned above. Both agencies concluded that suction dredging would not jeopardize the continued existence of either species. Each agency's Opinion included incidental take statements with non-discretionary reasonable and prudent measures to avoid or minimize take, and mandatory terms and conditions to implement those measures. In Chapter 2 of this EIS each agency's reasonable and prudent measures, terms and conditions, and recommendations discussed in the Forest's 2008 Biological Assessments for Lolo Creek and Moose Creek are consolidated into 32 specific operating conditions, design features or mitigation measures (hereafter referred to as design features).

Need for action

This action is needed to allow the Forest Service to approve, with no further environmental analysis, a limited number of Plans of Operations in specified reaches of Lolo Creek, Moose Creek, Independence Creek and Deadwood Creek. Various regulations require and authorize the Forest Service to approve and regulate all activities related to prospecting, exploring, and developing mineral resources on National Forest lands.

Several laws and regulations, including the Mining Law of 1872, Forest Service Surface Use Regulations (36 CFR 228 Subpart A), and Forest Service Manual (FSM) 2800 allow the public specific rights to enter, search for, and develop mineral resources on lands open for mineral entry. These regulations do not allow the Forest Service to deny entry or preempt the miners' statutory right granted under the 1872 Mining Law. These regulations direct the Forest Service to prepare the appropriate level of environmental analysis and documentation when proposed operations may significantly affect surface resources. The regulations require the Forest Service to develop mitigation measures to minimize adverse impacts related or incidental to mining by imposing reasonable conditions that do not materially interfere with operations. When included in Plans of Operation, these mitigation measures, along with necessary with State and Federal permits, would allow the Forest Service to approve the Plans of Operation with no further environmental analysis.

Project Development

On March 17, 2003 the Forest initiated government-to-government consultations with the Nez Perce Tribe regarding the project. Public scoping began in March 2003, when scoping letters explaining the proposal were mailed to 239 interested parties, other agencies and the Nez Perce Tribe. In February and September 2004, Forest Service representatives met with Nez Perce Tribal fisheries, watershed, and wildlife specialists to discuss the project. The Draft EIS was issued in March 2004. Comments were received from eleven parties and the Nez Perce Tribe. The FEIS and ROD were issued in December 2006. It was appealed by two groups and was subsequently withdrawn. This supplemental EIS clarifies the environmental analysis with regards to resource effects.

Issues

Issues were identified through public scoping and internal concerns. The key issues resulting from the proposed action are listed below. All issues, including those dropped from consideration, are further detailed in Chapter 1 of this document.

Water Quality - There was a concern that suction dredging would increase sediment production and increase turbidity to the streams; thereby reducing water quality. There are no water quality listed streams within the project area (IDEQ 2008). To meet the Forest Plan Lawsuit Stipulation of Dismissal, the proposed action and any alternatives considered were designed to produce no measurable increase in sediment as well as no measurable increase in bacteria, nutrients, or temperature. Watershed improvement projects have the potential to produce sediment in the short-term but were designed to result in log-term reductions in sediment and an overall net improvement on a watershed basis.

Aquatic Habitat and Species - There was a concern that suction dredging would negatively impact aquatic habitats and the species dependant on the habitat. The disturbance of existing habitats could alter spawning habitat, pool frequency and bank stability. Activities could also increase turbidity which indi-

rectly affect spawning and rearing habitat for a variety of species. Suction dredging could also cause direct mortality of fish, amphibians and invertebrates.

Riparian Wildlife and Plants - There was a concern that suction dredging would remove or damage riparian vegetation through trampling, dispersed camping and the movement of equipment into and out of the dredging sites. This in turn could affect sensitive wildlife and plant species.

Recreational Opportunities and Visual Resources - There was a concern that suction dredging would reduce the quality and quantity of recreational opportunities and would also affect visual resources. This may affect fisherman, campers and other forest visitors.

Nez Perce Tribe Treaty Rights - There was a concern that suction dredging activities would affect Nez Perce Tribal treaty rights by making the areas less desirable for hunting or fishing through the displacement of wildlife and fish. Activities may also affect chinook salmon spawning and rearing in the area. The Nez Perce Tribe collects adult chinook from Lolo Creek, raises and then releases them back into the creek as part of their Tribal Hatchery program.

Roadless Areas - There was a concern that suction dredging in Moose Creek would affect the quality of the Moose Mountain Roadless area. There are no roadless areas within the Lolo Creek activity areas.

Alternatives

Two action alternatives and one no action alternative were developed for the proposed activities. They are as follows:

Alternative 1: No Action

None of the proposed activities described in this summary would occur. This alternative could not be implemented under current law, including the Mining Law of 1872, and violates Forest Service regulations at 36 CFR 228A.

Alternative 2: Proposed Action

This alternative would authorize the decision maker to annually approve a limited number of Plans of Operation in specified reaches of Lolo Creek, Moose Creek, Independence Creek and Deadwood Creek. Approval would be contingent upon the operator complying with all Federal and State permitting requirements. The operator must include in their Plan of Operations specific design features adequate for protection of surface resources on the specific mine site. These requirements are detailed in this document and are based on the reasonable and prudent measures listed in the Biological Opinions prepared by USFWS (2008) and NOAA (2009).

Approval of any specific Plan of Operations would be in effect for the duration of the operating season from July 1(July 15 for Lolo Creek) through August 15, as long as the operation is conducted within the terms and conditions. A new Plan of Operations would have to be submitted annually and approved for each dredge operation before each mining season.

Alternative 3: Suction Dredging and Stream Improvement Projects

This is the preferred alternative. This alternative is the same as Alternative 2, except that it includes bank stabilization and reclamation of the abandoned Lolo #5 mining claim on Lolo Creek. This stream improvement project would stabilize and reclaim approximately 950 feet of Lolo Creek. It would not take place during critical salmonid spawning or migration periods, and would follow all appropriate Best Management Practices to minimize short-term impacts due to construction.

Major Conclusions

Major conclusions related to impacts from proposed activities include:

No measurable increase in sediment as well as no measurable increase in bacteria, nutrients, or temperature in Lolo or Moose Creeks is predicted to result from suction dredging activities. The watershed improvement project would result in long-term reductions in sediment from the Lolo #5 mining claim site.

Effects to turbidity would be temporary (average 5 hours per day for the 45 day (30 days for Lolo Creek) operating period). Turbidity levels would not exceed IDEQ standards.

Potential effects to aquatic habitats or species would be minimal due to design features. There would be no changes to pool frequency and quality or stream bank stability from suction dredging activity. Bank stability would be improved at the Lolo #5 mine site after reclamation activities are complete.

Potential effects to spawning gravels would be minimal due to design features. Spawning habitat is limited in both Lolo and Moose Creeks. Spawning areas would be identified by the Forest Service and miners would avoid dredging in those areas. Dredging may increase cobble embeddedness downstream but effects would be minimal.

Potential effects to aquatic species would be minimal due to design features. Direct mortality to fish and would be minimized by the placement of a screen over the dredge pump intake and the low number of fish in the area. Aquatic insect mortality would be unavoidable; however, recolonization is expected within 2 months.

Steelhead trout and bull trout occur in very low densities in Lolo Creek. Only bull trout occur in Moose Creek; the downstream Dworshak dam blocks migration of anadromous fish, including fall Chinook salmon and steelhead trout. Timing restrictions for suction dredging operations would minimize impacts to most larval and juvenile fish because operations would begin after steelhead trout and bull trout emerge from the substrate. Potential impacts to spring-run chinook would be limited to displacement during the hours of dredging activity.

Minimal effects to deer, moose, elk, marten, goshawk, fisher, and gray wolf from noise and the presence of humans in both Lolo and Moose Creeks would occur. The effects would be related to avoiding areas where people camp, recreate, or dredge. There is sufficient habitat surrounding all the mining claims to support the species during mining operations. There would be no effect to ESA listed lynx at the Moose Creek sites other than the avoidance of humans since no denning habitat occurs in the area.

Minimal effects to sensitive plants would occur. Foot traffic from miners in riparian areas may trample individual sensitive plants as they move their equipment to and from the stream channel. The risk is low due to the limited number of trails and camping sites they would use. Most of the sensitive riparian plant species do not occur on already disturbed sites. The risk is also expected to be low due to the limited numbers of sensitive plant sightings in the areas.

There would be minimal to no effects to total recreation visitation. Campers, fishermen, and other recreators generally avoid areas near dredging operations due to the noise created by the dredges. The duration is short and limited to the 45 days (30 days for Lolo Creek) dredging period for an average of 5 hours per day. Hikers on the Nez Perce National Historic Trail in Lolo Creek may be affected by dredge noise. The annoyance would be temporary as the trail parallels the creek for less than 1 mile on the northern end of the project area near Yoosa Creek (the Northwest Lolo Placer claim). The remainder of the Nez Perce and Lewis and Clark Historic Trails are not within audible or visual distance of miners in Lolo Creek.

Suction dredging operations would have minimal impacts to tribal treaty rights. There could be impacts to tribal fishing in 3% of the total area of mainstem Lolo Creek where suction dredge activities are proposed. Dredging operations may interfere with tribal fishing activities during the 30 day season on Lolo Creek. Dredging noise, activities in and near the streams may scare away salmon, however anecdotal information suggests that adult salmon often use the dredges for cover and juvenile fish are often seen feeding in the plume created by the dredge. The presence of miners and other recreators may impact the experience associated with traditional tribal fishing and gathering practices. Game animals may avoid stream corridors where suction dredge mines are operating. The effects are expected to be minimal since there is sufficient habitat surrounding the mining claims to support game species during mining operations. Suction dredging

would not cause direct impacts to tribal gathering activities, since camas, whitebark pine seeds, berries, and other commonly gathered foods are not found in the stream channel.

There would be no effects to the following roadless area characteristics in the Moose Mountain Roadless Area from suction dredge mining activities: public drinking water, reference landscapes, traditional cultural properties, local unique characteristics, undisturbed soil and air. There would be minimal but short term (average 5 hours per day for the 45 day dredging season) effects to water, plant and animal communities, threatened or sensitive wildlife, plant and fish species, non-motorized dispersed recreation, and the naturally appearing landscape. The majority of effects are related to the visibility of and the noise created by the dredges, the avoidance of the area by animals, the potential trampling of plants, and the increased turbidity and its potential effects on aquatic species. Overall dredging would have minimal and very localized effects on the roadless characteristics.

Changes between Final EIS and Draft Supplemental EIS

Nineteen unpatented mining claims lie within the Moose Mountain Roadless Area. The effects to roadless areas were not adequately addressed in the FEIS. The Idaho Roadless Rule was promulgated on October 16, 2008 (73 FR 61456) and established management direction for designated roadless areas in the State of Idaho. Under 36 CFR 294.25, the rule specifically addresses mineral activities in roadless areas. This Draft SEIS addresses effects to roadless area characteristics as defined in 36 CFR 294.21 under the Idaho Roadless Rule.

This Draft SEIS also clarifies that remote claims off existing roads and trails within the roadless area would be accessed by foot by miners. Miners are not given permission to use those roads closed or restricted to the general public.

The Draft SEIS clarifies the issue indicators used to determine the effects of the proposed activities and updated the analysis based on those indicators.

In the FEIS issued in 2004, Lolo Creek was identified as water quality impaired for nutrients, bacteria, sediment, and temperature under the 2002 IDEQ Integrated Report. A Total Maximum Daily Load (TMDL) was scheduled to be written. However, under the 2008 EPA approved Integrated Report, Lolo Creek no longer is listed for these parameters. IDEQ has identified 3 Lolo Creek tributaries, all of which lie outside the project area that a TMDL may be written for. They are Eldorado, Jim Brown, and Musselshell drainages (IDEQ, pers. comm., 2009). These water bodies would be further assessed for their 303(d) list impairment parameters to determine if load allocations are necessary.

The Independence Creek ford project was removed from Alternative 3 because this project has recently been analyzed under a categorical exclusion. This activity was included in the cumulative effects analysis for water quality in this Draft SEIS.

Local, site specific data was used in lieu of WATBAL to display existing conditions and to determine potential sediment effects to streams.

This analysis provides information regarding cumulative effect analysis areas, timeframes and past, present and future foreseeable activities.

This analysis provides a discussion of irretrievable commitment of resources. This was lacking in the FEIS.

Decisions to be Made

The Forest Supervisor of the CNF is the responsible officer who would review the evaluation of alternatives and their potential environmental consequences. The Forest Supervisor would determine whether or not to approve specific suction dredge operations and associated operating conditions, design features and mitigation measures for those operations in designated areas of Lolo and Moose Creeks.

This decision would be implemented through approval of Plans of Operation which meet the requirements described in the selected alternative and Forest Service surface management regulations found in 36 CFR

228. These regulations do not provide for denying a reasonable Plan of Operation; reasonable plans of operation must be approved. Although this is non-discretionary, a Plan of Operation can be constrained or mitigated to protect surface resources. The constraints cannot make the operation economically infeasible, but may still substantially alter a miner's proposal as needed to protect surface resources or meet environmental laws, such as the Clean Water Act and Endangered Species Act. Hence, the decision to be made concerns approval of resource protection measures that constitute one step in the approval process for plans of operation.

1.0 Purpose and Need

This Environmental Impact Statement (EIS) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq*.) and Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (40 CFR Parts 1500 - 1508).

1.1 Introduction and Background

The Clearwater National Forest (CNF) is a geographically diverse area in central Idaho that contains occurrences of gold, silver, antimony and copper. Since the 1860s, placer gold mining has occurred in rivers and streams across the Forest. Four of the more popular gold producing streams, Lolo Creek, Moose Creek, and two Moose Creek tributaries, Independence and Deadwood Creeks, have had sporadic mining activity over the years. Figure 1-1 shows Lolo and Moose Creeks in relation to the CNF boundaries and also shows the boundaries of the study areas associated with this analysis.

With the rise in gold prices in the 1970s, both streams experienced a renewed interest in prospecting for gold. It was also around this time that prospectors started using suction dredges to explore and mine instream gravels. While the numbers of miners who actually prospect varies from year to year, miners have established and maintained 17 mining claims on Lolo Creek and 26 on Moose Creek. Ownership of the claims is shared by 18 potential suction dredge operators on Lolo Creek and 38 potential suction dredgers on Moose Creek. The claims were located under the Mining Law of 1872 (see box in Section 1.4).

1.1.1 Permitting Process

Regulations at 36 CFR Part 228 direct the Forest Service to prepare the appropriate level of environmental analysis and documentation when proposed operations may affect surface resources. These regulations do not allow the Forest Service to deny entry or preempt the miners' statutory right granted under the 1872 Mining Law. The regulations require the Forest Service to develop mitigation measures to minimize adverse impacts on National Forest resources. The authority to manage the exploration and development of mineral resources within the National Forest System is jointly shared by the Secretaries of Interior (BLM) and Agriculture (Forest Service). The Department of the Interior administers the mining laws, and the Forest Service manages occupancy and use of the land's surface both on and off mining claims. The Forest Service should minimize or prevent adverse impacts related or incidental to mining by imposing reasonable conditions that do not materially interfere with operations.

The permitting process is described as follows.

- Operators present a plan of operations to the Forest Service.
- The FS completes the appropriate environmental analysis to comply with the National Environmental Policy Act. This analysis demonstrates operators compliance with clean water act based on design features in a Plan of Operations.
- Discharges from suction dredge operations qualify as point sources and require a Section 402 permit, National Pollutant Discharge Elimination System (NPDES) permit, authorization by EPA. The operators apply for their NPDES permit with EPA. All Section 402 permits must be certified by IDEQ under Clean Water Act, Section 401. IDEQ must grant, deny, or waive certification for a project before a federal permit or license can be issued.
- Upon completion of 401 certification by IDEQ, EPA can issue their NPDES permit to individual applicants (IDEQ, 2002).
- The Forest Service approves proposed plans for operations after operators have received their NPDES permit. Under the ***Idaho Stream Channel Protection Act*** (Idaho Code Section 42-3803(a)) dredge operators would also obtain a 3804B Joint Stream Alteration Permit under Section 404 from the Idaho Department of Water Resources (IDWR) and US Army Corps of Engineers (COE) before any suction dredge mining can be done.

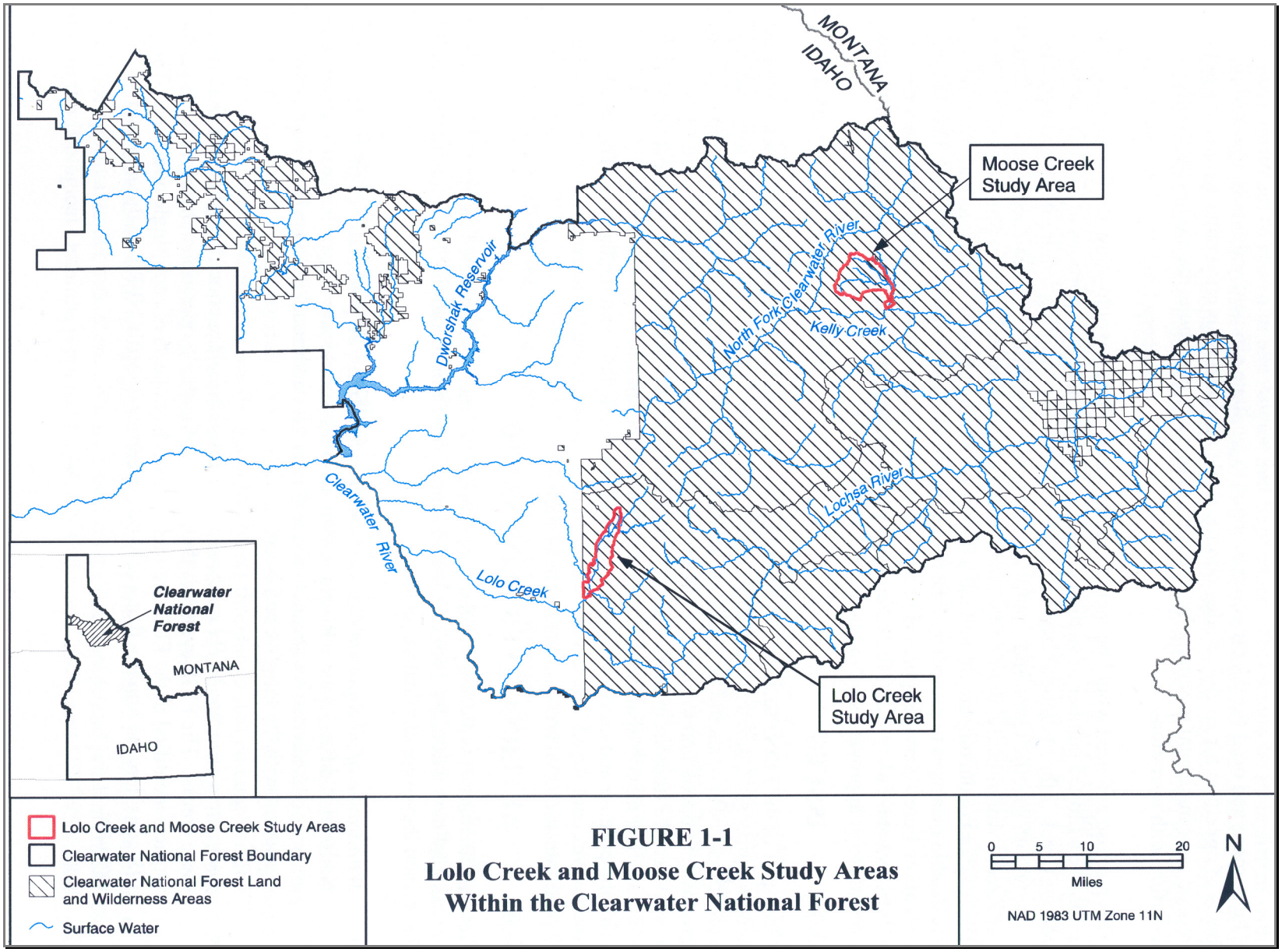


Figure 1-1: Lolo Creek and Moose Creek Study Areas within the Clearwater National Forest

1.1.2 Overview of Small-Scale Suction Dredging

Gold is found in Lolo and Moose Creek drainages as alluvial placers where the gold is concentrated in past or present stream channels. To form placer deposits, gold is eroded from its parent rock upstream and carried downstream by the action of the water. The particles range in size from "flour" gold (generally, minus-400 mesh, or less than 0.0015 inches in diameter) to much larger nuggets. The distance gold particles move depends on the size and shape of the particle and on the energy of the stream. Gold is picked up where currents are fast and deposited when stream velocity slows. One typical area where stream velocity decreases is where the stream enters a pool. Other areas include the inside curve of bends, where the flow is slower than in the main channel and outside bend. Water also slows in eddies on the downstream sides of obstructions in the stream, such as rocks, vegetation, logs, or bedrock outcrops. As one of the denser materials transported by any stream, gold is among the first to drop out when a stream slows and energy diminishes. Unless the gold is picked up again, it often sifts down to a hardpan layer or to bedrock by the action of gravity.

Miners have long recognized how and where gold is likely to be concentrated and have operated accordingly. Most streams in Idaho were explored in the 1800s, and many continue to give up gold to miners. In Lolo and Moose Creeks, gold is recovered by operators who use small-scale suction dredges. Figure 1-2 shows a typical suction dredge and identifies its basic components. Dredges typically use gasoline-powered pumps to create suction in a flexible pipe up to five inches in diameter. The suction pulls stream sediment, gravel and small rocks, and other materials (collectively, the "overburden") from the stream bottom, along with any gold. All this material is routed through the header box and onto a sluice box. The sluice box channels the water and other material over a series of riffles that serve to create pockets of slow water immediately behind each riffle – the heavier material, including any gold, settles behind the riffles and the rest goes directly back into the stream. The entire system (e.g., gasoline-powered engine, pump, and sluice box) is mounted on adjustable stilts or a floating platform that is anchored or tethered near the work area.

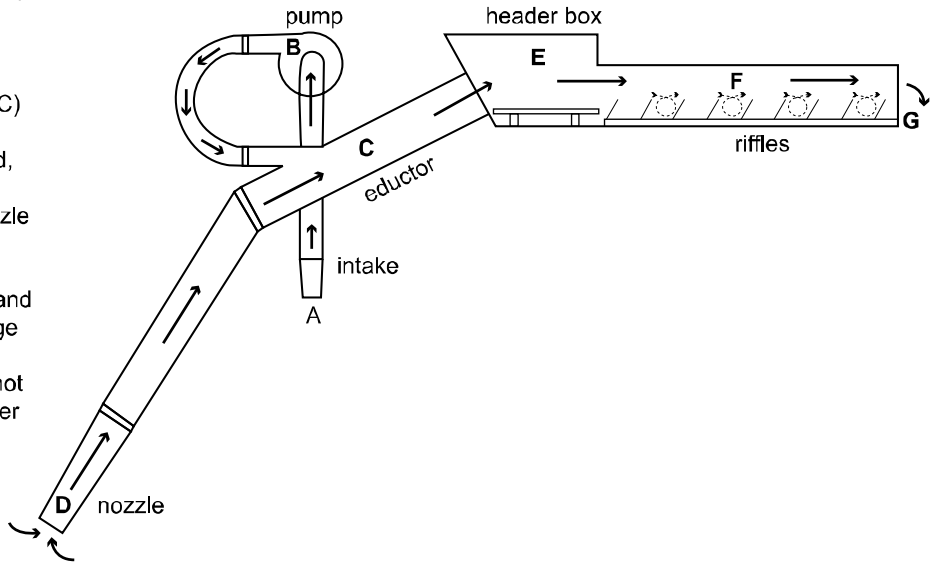
Operators try to maintain a hole open down to bedrock in which to work. As the operator advances upstream, cobbles and rocks too large to be vacuumed up through the nozzle and suction hose are pried loose and placed to the edge or back of the hole while smaller material is pumped through the sluice box and — except for gold and other heavy materials that may settle out behind riffles — immediately discharged out of the sluice box and back into the stream.

Some operators operate air compressors that provide air to "divers" so they can remain under water while examining and suction-dredging deeper holes. A rule of thumb is that up to one foot of overburden can be worked economically for each inch of dredge-hose diameter (USFS 2001c).

Small-scale suction dredge operators prospect or explore and mine only a relatively short distance each mining season, from less than 10 feet of stream up to a maximum of perhaps 200-300 feet. Significant lengths of Lolo and Moose Creeks have experienced some form of past mining, many of the previously impacted sites have not been suction dredged to date. Suction dredge operators search for areas that were overlooked or avoided by past miners. Many of the Lolo and Moose Creek suction dredge operators have found gold in previously mined areas by meticulously exploring cracks and crevices in bedrock. The amount of material worked by small-scale suction dredgers varies widely, from less than a cubic yard per day up to 5 or 10 cubic yards per day. In areas of large substrate, more time and effort is spent by the operator moving small boulders and cobble larger than the nozzle diameter out of the work area. Consequently, in larger substrate less material is processed through the dredge. The opposite is true for dredging in substrate that is predominantly smaller than the dredge nozzle diameter.

Miners typically move their dredges into the stream at the beginning of the season and do not remove their dredge until the last day of operations. There is not repeated loading or unloading of the dredges. They only use those roads open to the general public.

Water is sucked through a screened intake (A) by water pump (B). The force of high pressure water into the eductor (C) creates a suction at nozzle (D). Water, sand, gravel and gold are sucked through the nozzle into the header box (E), across the riffles (F) where gold is trapped, and out the end of the dredge (G) into the stream. Streambed material is not sucked through the water pump.



Adapted from Siskiyou National Forest 2001

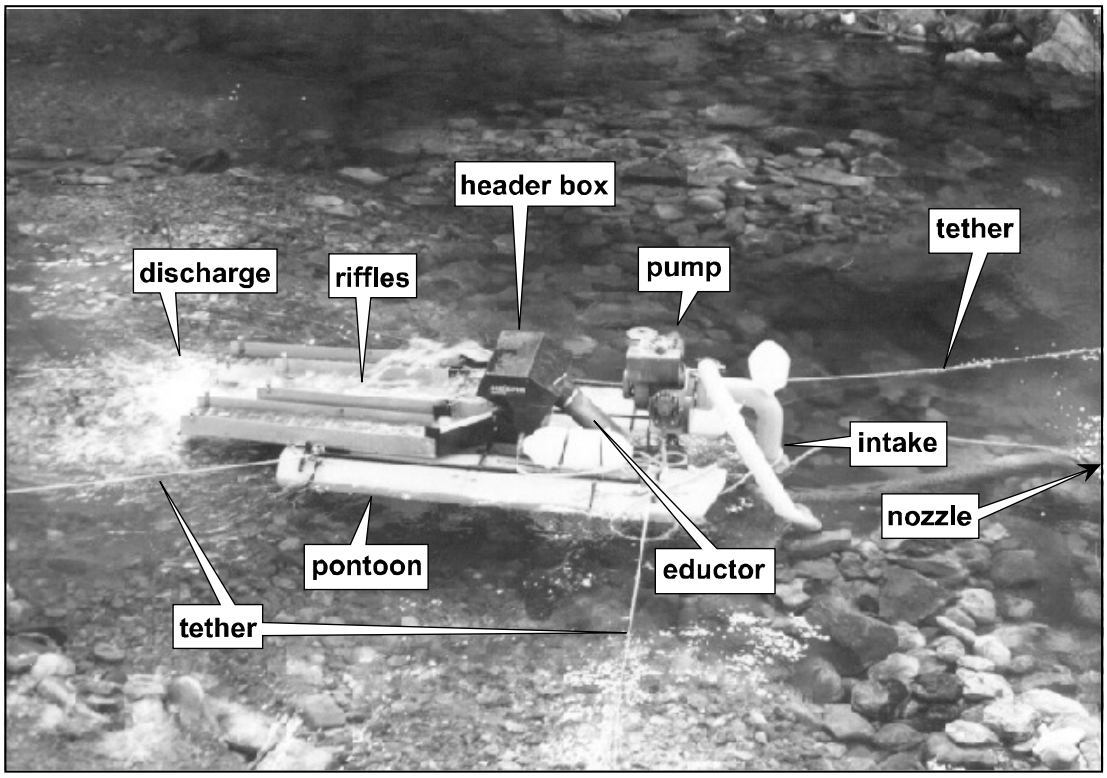


Figure 1-2: Typical Small-Scale Suction Dredge

1.2 Need for an EIS

The Forest Service has a responsibility to manage surface impacts from mining activities on National Forest System lands. Miners with claims in Lolo and Moose Creeks have expressed a desire to continue mining on the Forest. The Forest Service has initiated this environmental analysis; pursuant to mining regulations at 36 CFR 228.4 (f), to analyze the effects of suction dredging on resources and to develop mitigation measures to protect those resources.

Until the late 1990s, Lolo Creek and Moose Creek miners conducted suction dredge operations under 36 CFR Part 228 by notifying the Forest of their activities through a notice of intent to operate. The miners submit a plan of operations to the District Ranger. The ranger reviews the design features in the plan to determine that the effects of the operations are adequate to protect surface resources at the specific site.

The State of Idaho Department of Water Resources also required suction dredge operations throughout the State to apply for a 3804-A stream alteration permit. The permit included a list of specific design features for resource protection. In an effort to streamline the process, National Forests in Idaho collectively agreed that operations that implemented the State's BMPs could operate in selected streams with little or no effect to fish and water quality. Consequently, small-scale suction dredge operations were generally considered by the Clearwater and other National Forest in Idaho to have minimal effect, not requiring additional review and approval of Plan of Operations for each operator.

In 1997, steelhead trout were listed as a threatened species within the Snake River drainage under the Endangered Species Act. In 1998, bull trout were also listed as a threatened species within the Snake River drainage. Since the listings, the Forest has consulted with the National Oceanic and Atmospheric Administration Fisheries (NOAA) and the U.S. Fish and Wildlife Service (USFWS) regarding the potential effects that Forest activities might have on these species.

Following the 2001 mining season, the CNF initiated the process of consulting, under Section 7 of the Endangered Species Act, with NOAA and USFWS concerning the effects of small-scale suction dredging on these threatened species in Lolo Creek and Moose Creek. Consultations have been completed, but the Forest has not approved any Plans of Operation for dredging in Lolo Creek or Moose Creek, and no dredging has occurred since the 2001 mining season. Because of the concerns for ESA listed species, the Forest decided to conduct an EIS to assess the impacts to those species.

In a 2008 Biological Assessment (BA), Forest determined that suction dredging was "likely to adversely affect" steelhead trout, but was "not likely to adversely affect" bull trout in Lolo Creek. The Forest determined that suction dredging was "likely to adversely affect bull trout" in Moose Creek. In their respective 2009 and 2008 Biological Opinions, NOAA and USFWS agreed with the Forest Service's determinations. Both agencies concluded that suction dredging would not jeopardize the continued existence of either species. Each agency's Opinion included incidental take statements with non-discretionary reasonable and prudent measures to avoid or minimize take, and mandatory terms and conditions to implement those measures. In Chapter 2 of this EIS each agency's reasonable and prudent measures, terms and conditions, and recommendations discussed in the Forest's 2008 Biological Assessments for Lolo Creek and Moose Creek are consolidated into 30 design features.

1.2.1 Purpose and Need for the Proposed Action

Many laws, regulations, policies, and plans direct the Forest Service to support and facilitate mineral extraction while minimizing adverse environmental effects on National Forest resources and ensuring compliance with applicable environmental laws. The purpose and need for the proposed action is to protect surface resources through the approval of acceptable mining Plans of Operations.

Purpose: Develop operating conditions and mitigations measures that protect surface resources, including threatened fish species, from impacts of suction dredging.

Need: Allow the Forest Service to approve, a limited number of Plans of Operations in specified reaches of Lolo Creek, Moose Creek, Independence Creek and Deadwood Creek because regulations do not allow the Forest Service to deny entry or preempt the miners' statutory right granted under the 1872 Mining Law.

Forest Service regulations at 36 CFR 228.5 states that "a Plan of Operation would be analyzed by the authorized officer to determine the reasonableness of the requirements for surface resource protection." All mining proposals, including those submitted by small-scale suction dredge operators, are made under the authority of the United States mining laws (30 U.S.C. 21-45), which confer the statutory right to enter upon public lands for the purpose of exploration and development of mineral resources. The CNF received some Plans of Operation, and anticipates others of similar scale, from people proposing to use small-scale suction dredges to prospect, explore, and extract gold from instream gravels on and off placer mining claims in Lolo Creek and Moose Creek. The Forest Service has the responsibility to analyze these Plans of Operations and approve them, if the surface resource protection requirements found in these plans are reasonable. These mitigation measures, along with necessary with State and Federal permits, would allow the Forest Service to approve the Plans of Operation. Approved Plans of Operation would allow up to 18 small-scale suction dredge operations on the 17 claims in Lolo Creek and up to 38 small-scale suction dredge operations on the 26 claims in Moose, Independence and Deadwood creeks.

1.3 Decision Framework

The Forest Supervisor of the CNF is the responsible officer who would review the evaluation of alternatives and their potential environmental consequences. The Forest Supervisor would determine whether or not to approve specific suction dredge operations and associated operating conditions, design features and mitigation measures for those operations in designated areas of Lolo and Moose Creeks.

This decision would be implemented through approval of Plans of Operation which meet the requirements described in the selected alternative and Forest Service surface management regulations found in 36 CFR 228. These regulations do not provide for denying a reasonable Plan of Operation; reasonable plans of operation must be approved. Although this is non-discretionary, a Plan of Operation can be constrained or mitigated to protect surface resources. The constraints cannot make the operation economically infeasible, but may still substantially alter a miner's proposal as needed to protect surface resources or meet environmental laws, such as the Clean Water Act and Endangered Species Act. Hence, the decisions to be made concerns approval of resource protection measures that constitute one step in the approval process for plans of operation.

1.4 Regulatory Framework and Consistency

Forest Service mineral objectives are to manage National Forest System lands to accommodate and facilitate the exploration, development, and production of mineral resources, while integrating these activities with the use and conservation of other resources to the fullest extent possible.

This project analysis and documentation of effects is consistent with the direction described below.

The ***Mining Law of 1872*** states that all valuable mineral deposits in lands belonging to the United States are to be free and open to exploration. In order to make a discovery of a valuable mineral deposit, the operator has a right under the 1872 Mining Law to enter upon public lands open to mineral entry, and to prospect and explore for mineral resources. The 1872 Law allows for mining claim location and possessory title to the valuable minerals within the location. While miners have rights under the 1872 Mining Law, they are legally required to comply with applicable laws passed since 1872 that have placed additional requirements upon miners. Some of these laws are described below.

The ***Organic Administration Act of 1897*** affirms the public's right to enter, search for, and develop mineral resources on lands open for mineral entry, and authorizes the Forest Service to approve and regulate all activities related to prospecting, exploring, and developing mineral resources.

The ***Federal Land Policy and Management Act of 1976*** *FLPMA* (43 U.S.C. 1701-1782) is the organic act for the Bureau of Land Management (BLM), which manages the mineral resources on all federal lands, including National Forest System lands, and administers mining claims under the Mining Law of 1872.

The ***Multiple Use Mining Act of 1955*** directs that any mining claim located after July 23, 1955, shall not be used, prior to issuance of patent, for any purposes other than prospecting, mining or processing opera-

tions and uses reasonably incident thereto, and that such claims shall be subject to the right of the United States to manage and dispose of vegetative surface resources and to manage other surface resources, and the right of the United States, its permittees, and licensees, to use so much of the surface as may be necessary for such purposes or for access to adjacent land.

The ***Mining and Mineral Policy Act of 1970*** directs the Federal Government to foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs.

The ***Forest Service Surface Use Regulations*** (36 CFR Part 228 Subpart A) set forth rules and procedures for use of the surface of National Forest System Lands in connection with mineral operations both on and off mining claims. The regulations direct the Forest Service to prepare the appropriate level of environmental analysis and documentation when proposed operations may significantly affect surface resources. These regulations do not allow the Forest Service to deny entry or preempt the miners' statutory right granted under the 1872 Mining Law. The regulations require the Forest Service to develop mitigation measures to minimize adverse impacts on National Forest resources. The 228 regulations include requirements for reclamation.

The ***Forest Service Manual (FSM) 2800*** discusses specific responsibilities and considerations for dealing with a Plan of Operation. It states that the Forest Service should minimize or prevent adverse impacts related or incidental to mining by imposing reasonable conditions that do not materially interfere with operations.

The ***Clean Water Act*** (33 U.S.C. 1251 *et seq.*) sets goals to eliminate discharges of pollutants into navigable water, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment. Sections 303 (d), 313, 401, 402, and 404 of the Clean Water Act, are potentially applicable to the suction dredging operations that might be approved.

The ***Endangered Species Act*** (ESA) (16 U.S.C. 1531-1544) Section 7(a) of the Endangered Species Act requires Federal agencies to consult with USFWS and/or NOAA, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats.

Making Claims Under the Mining Law of 1872

The General Mining Laws (most notably, the *Mining Law* of 1872) establish a policy for minerals development on Federal lands. In general, the law provides that persons are authorized to enter Federal lands and establish or locate a claim to a valuable mineral deposit. Once a claim has been properly located (and, since 1976, recorded with BLM), the claimant gains a possessory right to the land for purposes of mineral development. Mining claims are fully recognized private interests that may be traded or sold. The possessory interest is considered private property subject to Fifth Amendment protection against takings by the United States without just compensation.

There are several types of mining claims: lode, placer, mill site, and tunnel. Suction dredge operations generally take place on unclaimed lands or on placer claims. Placer claims are located on deposits of loose, unconsolidated material such as gravel beds, or on certain consolidated sedimentary deposits lying at the surface. There are few limitations on the exterior dimensions of a placer mining claim, but a single individual cannot locate more then 20 acres in each claim. An association of two owners may locate 40 acres, three may locate 60 acres, etc. up to a maximum of 160 acres in a single placer claim located by eight or more persons. Corporations are limited to 20 acres per claim.

The CNF has consulted with both USFWS and NOAA regarding proposed suction dredging activities. For Lolo Creek, the Biological Assessments determined that suction dredging was "likely to adversely affect" steelhead trout, but was "not likely to adversely affect" Lolo Creek bull trout. For Moose Creek, the Forest Service determined that suction dredging was "likely to adversely affect bull trout". In their respective Biological Opinions, NOAA (2009) and USFWS (2008a) agreed with the Forest's determinations. Both agencies further concluded that suction dredging would not jeopardize either species if specific terms and conditions minimizing impacts to streams and minimizing take were adopted.

The ***Idaho Roadless Rule*** (36 CFR 294) was promulgated on October 16, 2008 and establishes management direction for designated roadless areas in Idaho. A portion of this project lies within the Moose Mountain Roadless Area and is managed under the back country restoration and primitive themes.

The ***Clearwater National Forest (CNF) Plan*** (USFS 1987) as amended guides all natural resource management activities by providing a foundation and framework of standards and guidelines for National Forest System lands administered by the CNF. The Suction Dredging EIS is tiered to the CNF Plan, and the Forest Plan FEIS and Record of Decision. Forestwide goals and standards are found in Chapter II of the plan on pages II-3 through II-30. These goals, objectives and standards discuss the need to facilitate the orderly development of mineral commodities and provide for timely, reasonable, effective and economically feasible environmental protections. The Clearwater Forest Plan was amended by the Decision Notice/Decision Record, Environmental Assessment, and Finding of No Significant Impact for management of anadromous fish-producing watersheds on Federal Lands in eastern Oregon and Washington, Idaho, and portions of California in 1995 (PACFISH). The Forest Plan was also amended in 1995 by the Decision Notice and Finding of No Significant Impact for the Inland Native Fish Strategy for managing fish-producing watersheds in eastern Oregon and Washington, Idaho, Western Montana and portions of Nevada (INFISH). PACFISH and INFISH provide guidance and monitoring requirements for minimizing impacts to surface resources, especially in relationship to Riparian Habitat Conservation Areas (RHCAs). This EIS is tiered to PACFISH and INFISH plan and analysis document contents not in conflict with Forest Service locatable mineral regulations found at 36 CFR 228A.

Section 106 of the ***National Historic Preservation Act*** (NHPA) (16 U.S.C. 470) requires that federal agencies evaluate the effects of their actions on historical, archaeological, and cultural resources and afford the Advisory Council on Historic Preservation opportunities to comment on the proposed undertaking. The CNF has identified cultural resources included in (or eligible for inclusion in) the National Register of Historic Places (NRHP) that are located in or near the project area and identified the possible effects of proposed actions and included measures to minimize or mitigate potential adverse effects.

The CNF is required to comply with Section 106 of the NHPA prior to approving proposed plans of operations for one of the action alternatives. The Forest has initiated contact with the Nez Perce Tribe to identify potential traditional cultural resource concerns in the study area. The Forest Service has concurrence from the State Historic Preservation Office.

The ***Nez Perce National Historic Trail Act of 1986*** (16 U.S.C. 1244) amended the National Trails System Act to create the Nez Perce National Historic Trust. Less than one mile of the Nez Perce Trail may be affected visually and audibly by one suction dredge mining claim on Lolo Creek for a maximum of 30 days during the dredging season.

The ***Executive Order 12898,*** *Federal Actions to Address Environmental Justice in Minority and Low Income Populations,* directs federal agencies to identify and address, as appropriate, disproportionately high and adverse health and environmental impacts on minority and low-income populations. There is no human population in the vicinity of the project sites. The Nez Perce Tribe holds treaty rights for fishing, hunting, and gathering in both Lolo Creek and Moose Creek. CNF has initiated consultations with the Nez Perce regarding the proposed action and alternatives

1.5 Scope of the Analysis

This EIS evaluates the potential impacts of CNF approval of proposed plans of operation for small-scale suction dredge operations in sections of Lolo Creek, Moose Creek, and two tributaries of Moose Creek, Independence Creek and Deadwood Creek, and of alternatives to this proposed action.

CEQ's NEPA regulations require that Federal agencies consider three types of actions to determine the scope of an EIS (40 CFR 1508.25).

Connected Actions are those actions that are closely related. Actions are connected if they automatically trigger other actions that may require environmental analysis; if they cannot or would not proceed unless other actions are taken previously or simultaneously; and if they are interdependent parts of a larger

action and depend on the larger action for justification. There are no connected actions for purposes of this proposed action – Alternatives 2 and 3 contemplate approval of multiple plans of operation.

Similar Actions are those which, when viewed with other reasonably foreseeable proposed actions, have similarities that provide a basis for evaluating their environmental consequences together, but are not necessarily connected. For purposes of this EIS, Forest Service approval of multiple plans of operation are considered to be similar actions. The analysis considers the approval of 18 plans of operation on 17 claims in Lolo Creek and 38 plans on 26 claims in Moose Creek.

Cumulative Actions are those actions, which when viewed with other proposed actions have cumulatively significant impacts and therefore should be discussed in the same impact statement. This EIS considers the potential consequences of annual approval of 18 plans of operation in Lolo Creek and 38 plans in Moose Creek, which is a reasonable estimate of the maximum number of operations, and also considers other management actions in the area. Other past and reasonably foreseeable actions include a continuation of ongoing cattle grazing allotments, past and planned future timber harvest in the Lolo Creek study area, and road modifications and maintenance in both study areas.

The regulations also require agencies to consider three types of *alternatives*: the No Action Alternative, the proposed action, and other reasonable courses of actions. The EIS identifies these alternatives in Chapter 2 and evaluates the potential impacts under each in Chapter 4.

In addition, agencies must consider three types of *effects* in an EIS: direct, indirect and cumulative. The EIS discloses the direct, indirect and cumulative effects in Chapter 4. The cumulative effects analysis considered geographic boundaries of the effects; time frames (determining how far into the future to analyze cumulative effects); and past, present, and reasonably foreseeable future actions. The physical bounds of this analysis are the reaches of Lolo Creek, Moose Creek, Independence Creek, and Deadwood Creek described in Chapter 2 and the extent to which impacts may reach downstream or outside of these areas.

In the context of administrative scope, this analysis: (a) is limited to the minerals-based proposed action, (b) is not a general management plan for Lolo Creek or Moose Creek, and (c) is the final NEPA documentation for future approvals of plans of operation that meet the terms and conditions of approval.

1.6 Public Involvement

On March 17, 2003 the Forest notified the Nez Perce Tribe of the imminent scoping and environmental analysis and initiated government-to-government consultations regarding the project. On March 21, 2003, the Forest mailed letters to 239 interested parties or individuals and the Nez Perce Tribe. The Forest published a scoping notice in the *Lewiston Morning Tribune* on March 31, 2003. On April 4, 2003, CNF published in the Federal Register a Notice of Intent to prepare this EIS (65 FR 16465-16466). The Forest received comments from a total of 40 individuals and organizations. Comments ranged from criticism of the Forest Service for suggesting that any conditions could or should be placed on small-scale suction dredge operations, to support for the proposal, to opposition to all suction dredging.

Forest Service representatives met with Nez Perce Tribal fisheries, watershed, and wildlife specialists on February 13, 2004,and again with Tribal water resource personnel on September 16, 2004.

The Draft EIS was issued in March 2004. Comments were received from 11 parties and the Nez Perce Tribe. The Final EIS and Record of Decision were issued in December 2006. It was appealed by 2 groups and was subsequently withdrawn. This draft supplemental EIS clarifies the environmental analysis with regards to resource effects.

1.7 Issues

Issues are statements of problems to be solved or problems that may be created by the proposed actions. The proposed action was developed to meet the purpose and need for action. The interdisciplinary team and regulatory agencies developed design features, operating conditions and term and conditions for this

project to assure minimal effects to resources. Project issued identified by the interdisciplinary team and through public scoping are grouped into the categories described below.

1.7.1 Issues Used to Develop Design Criteria and/or Mitigation

The following issues were determined to be important through scoping and guided the design of the action alternatives.

1.7.1.1 Effects to Water Quality

There is a concern that suction dredging would increase sediment production and increase turbidity to the streams; thereby reducing water quality. There are no water quality listed streams within the project area (IDEQ 2008). To meet the Forest Plan Lawsuit Stipulation of Dismissal, the proposed action and any alternatives considered would be designed to produce no measurable increase in sediment as well as no measurable increase in bacteria, nutrients, or temperature. Watershed improvement projects have the potential to produce sediment in the short-term but are designed to result in log-term reductions in sediment and an overall net improvement on a watershed basis.

Bedload is a measurement of sediment and larger size particles that move by rolling or sliding along the stream bottom. If dredging removed large stable substrates it could affect the energy and direction of the stream flow and cause the channel to change by eroding the channel bottom or banks. Bedload added to the suspended load can be used to determine the total sediment load for a stream. However, design features and terms and conditions in Chapter 2 prevent the undercutting and destabilization of stream banks and channels.

Suction dredging typically involves dredging one or several cone-shaped holes in the streambed, with the excavated material then placed in a pile or placed into a previously dredged hole. In both Lolo and Moose Creeks, suction dredge operators prefer dredging in areas of larger substrate, because more gold tends to be recovered in those areas. While dredging, small boulders and large cobble are moved out of the way or removed from the hole as the dredge operator works their way to bedrock. Once on bedrock, the operator generally works along the bedrock cleaning out crevices with small pry bars and other similar tools. Terms and conditions prevent the removal of large stable boulders. Prior to moving to a new site, the operator must disperse and backfill all dredge holes and tailing redistributed to avoid creating unstable spawning sites. Because of these design features and terms and conditions, channel stability as described by bedload would not be affected and would not be further discussed in this analysis.

Issue Indicators:

- Increases in terrestrial sediment input to stream
- Increase in turbidity based on meeting State water quality standards

1.7.1.2 Effects to Aquatic Habitat and Species (including TES, invertebrates and amphibians)

There is a concern that suction dredging would negatively impact aquatic habitats and the species dependant on the habitat. The disturbance of existing habitats could alter spawning habitat, pool frequency and bank stability. Activities could also increase turbidity which indirectly affect spawning and rearing habitat for a variety of species. Suction dredging could also cause direct mortality of fish, amphibians and invertebrates.

Issue indicators:

- Increases in terrestrial sediment input to stream
- Increases in turbidity effects on the risk of displacing of aquatic species
- Changes to pool frequency and quality based on filling by dredge activities or removal of large in-stream woody material
- Stream bank stability based on disturbance of stream bank
- Degradation to spawning gravels by direct disturbance and infiltration by fine sediments

- Direct mortality or injury to aquatic species

1.7.2 Other Issues Carried Through the Analysis

1.7.2.1 Riparian Wildlife and Plants

There is a concern that suction dredge operations would remove or damage riparian vegetation through trampling, dispersed camping and the movement of equipment into and out of the dredging sites. This in turn could affect sensitive wildlife and plant species.

Issue Indicators:

- Effects to sensitive wildlife species- loss of habitat and potential direct mortality
- Effects to sensitive plant species- loss of habitat and potential direct mortality

1.7.2.2 Recreational Opportunities and Visual Resources

There is a concern that suction dredging would reduce the quality and quantity of recreational opportunities for fisherman, campers and other forest visitors.

Issue Indicators:

- Recreational opportunities based on location, size and timing of dredging activities

1.7.2.3 Effects to Roadless Areas

There is a concern that suction dredging operations in Moose Creek would affect the quality of the Moose Mountain Roadless area. There are no roadless areas within the Lolo Creek activity areas.

Issue Indicator:

- Effects to roadless area characteristics as defined by 36 CFR 294.21

1.7.2.4 Effects to Nez Perce Tribe Treaty Rights

There is a concern that suction dredging activities would affect the ability of the Nez Perce Tribal to the hunt, fish, and gather on their ceded lands, which includes both the Lolo and Moose Creek drainages. Activities may also affect chinook salmon spawning and rearing in Lolo Creek. The Nez Perce Tribe collects adult chinook from Lolo Creek, raises and then releases them back into the creek.

Issue Indicators:

- Effects to tribal hunting
- Effects to anadromous and resident fish species as measured by sediment, turbidity, pool frequency and quality, bank stability, spawning gravel quality, and direct mortality to fish.
- Effects to gathering activities

1.7.3 Issues Decided by law or Policy, Not Affected by the Proposal, or Outside the Scope of the Project

These issues were found to be non-relevant to the decision, since they are outside the scope of the proposal, already decided by law or policy, beyond the geographic influence of the proposal, or not affected by the proposal. The rationale for why these issues would not be considered in detail in this analysis is discussed below.

1.7.3.1 Mining Issues

There was a concern by some that the Forest Service was materially interfering with dredging activities. Others cautioned that mining claims must be valid. Others felt that the public derived no revenue from

mining and a net public benefit from mining needed to be analyzed and that reclamation bonding should be required for suction dredging activities.

The Forest Service does not prevent mining operations; however, in compliance with mining laws and Forest Service regulations, it provides operating conditions, design features and mitigation features under which suction dredging can occur.

The Forest Service Policy on Mining of Public Domain Mineral Estate (USFS 2003g) states "On National Forest system lands reserved from public domain and open to entry under the Mining Law, the Forest Service is not required to inquire into claim validity before processing and approving proposed plans of operations." In order to prospect, explore, and make a discovery of a valuable mineral deposit or establish valid mining claims, the operator has a right under the 1872 Mining Law to enter upon national forests and to conduct upon those lands reasonable activities to prospect and explore for mineral resources. Exercise of this right does not even require the staking of a mining claim, a fact recognized in the Forest Service locatable mineral regulations at 36 CFR 228.3(a), where mineral operations are defined and it is clearly stated that the Forest Service's regulations apply to all functions, work, activities, and uses reasonably incidental to all phases of mineral exploration and mining under the 1872 Mining Law, whether located on or off mining claims.

As described above, mining is allowed by law. No net public benefit is required for suction dredging activities. However, miners bolster local economies through purchase of equipment, food, gas and other amenities.

Reclamation bonding is required under 36 CFR 228.13 and Forest Service manual direction 2817.24. Reclamation costs would be determined at the pre-mining meeting with each individual operator. The operator provides a guarantee to perform reclamation work in the amount equal to the estimated cost of the work.

1.7.3.2 Impacts to Heritage and Cultural Resources

There was a concern that suction dredging could affect heritage and cultural resources in both Lolo and Moose Creek drainages. There are several recorded heritage resource sites in these areas. Impacts to traditional resources, which may or may not be eligible for the National Register of Historic Places (NRHP), are identified in consultation with the affected groups, such as Native American tribes. Until a formal determination of National Register eligibility is made, all recorded and unrecorded heritage resource sites are treated as eligible for nomination to the NRHP. The Forest Service determined that suction dredging would not adversely affect known NRHP-eligible heritage resources in the study areas (Vallier, 2004).

Portions of the Lewis and Clark and Nee Me Poo National Historic Trails cross the analysis area. Both are included in the Lolo Trail National Historic Landmark. Only one claim (Lucky Beau) is located within the Nez Perce National Historic Trail Corridor. Suction dredging could affect unknown resources within the creeks themselves, but operating conditions, design features and mitigation measures would minimize potential effects.

Compliance with Section 106 of the National Historic Preservation Act, including survey and eligibility evaluation of potentially affected resources, was completed for the study areas. Mitigation measures require involvement during the planning and monitoring of the construction by the Forest Archaeologist. Other measures include informing suction dredge operators about the importance of historic features, and not allowing dredge miners to excavate, disturb, or reuse historic materials or features. Sites at or near dredge locations would be periodically monitored during the dredging activities to insure compliance with operating plans, including avoidance of historic properties. Forest Service regulations and policy require that discovery of any potential heritage resource be left alone and reported to the District Ranger and Forest archaeologist. Should a suction dredge operator uncover a resource while working, work would be stopped immediately, pending inspection by the Forest archaeologist. If the Forest archaeologist identifies NHRP-eligible resources, mitigation measures would be identified in consultation with the Idaho State Historic Preservation Office and (if Native American resources are potentially affected) tribal groups

In summary, project operating conditions, design features and mitigation measures would minimize potential effects to heritage resources. If any resources were discovered during project implementations,

project activities would cease pending inspection by a Forest archaeologist. Mining Plans of Operations include regulation found in 36 CFR 228.4e and 36 CFR 800 to protect cultural resources.

1.8 Availability of Project Files

An important consideration in preparation of this EIS has been the reduction of paperwork as specified in 40 CFR 1500.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated. More detailed information is in the project file in the District planning records and is available for public inspection.

The reader may want to refer to the Clearwater Forest Plan and EIS (USFS 1987). The present EIS is "tiered" to the Forest Plan EIS and Record of Decision, as encouraged in 40 CFR 1502.20. Copies of the Forest Plan, Forest Plan EIS, and Record of Decision are available at libraries in the CNF locale and at the Forest Supervisor and Ranger District offices.

2.0 Proposed Action and Alternatives

This chapter describes the alternatives selected for detailed consideration in the EIS and those eliminated from further consideration. The chapter also compares the features of the alternatives, identifies the preferred, and compares the alternatives as they relate to the purpose and issues.

2.1 Alternatives Considered in Detail

2.1.1 Alternative 1: No Action

The "no action" alternative is required by regulation in 40 CFR 1502.14(d). It is used, in part, to compare against the action alternatives to determine the effects of not implementing an action alternative. For purposes of this EIS, the No Action Alternative is defined as not approving proposed Plans of Operation. Under this alternative, miners who submit Plans of Operation for suction dredging in Lolo Creek and Moose Creek would not receive approval for their plans of operation. No suction dredging would be allowed under the Mining Law or under any other authorization. This alternative could not be implemented since it does not comply with the Mining Law of 1872 and violates Forest Service regulations at 36 CFR 228A. However, consistent with (40 CFR 1506.2(d)), this alternative provides a comparable environmental baseline against which to evaluate effects of the action alternatives.

The following trends would likely continue under this alternative:

Under 36 CFR 228A it is illegal for the Forest Service to deny entry or preempt the miners' statutory right granted under the 1872 Mining Law. The Forest Service would not be in compliance with applicable mining law and Forest Service regulation.

Water quality trends would continue for sediment and turbidity. Existing roads and camping would continue to contribute low levels of sediment and turbidity, as would the Lolo #5 abandoned mine area.

Aquatic habitats would be maintained or would improve over time. Stream habitat building processes such as large wood input and riparian vegetation growth would continue. Aquatic species dependent on the habitat would continue to occupy the available habitat.

Direct mortality of fish species would continue to occur from fisherman and the Tribal hatchery program (adult removal only).

During the 45 day (30 days for Lolo Creek) mining season, forest visitors would use the campsites previously used by recreational suction dredge miners. Recreational visitors, vehicles, generators and aircraft would continue to produce background noise. Recreational activities such as hunting, fishing, camping and hiking would continue. Forest visitors would continue minor trampling of riparian vegetation. Dispersed campers and other forest visitors would continue to potentially disturb riparian wildlife and plant species.

There would be no impacts to Nez Perce Tribal Treaty Rights or traditional uses related to fish. Tribal hunting, gathering and fishing would continue as it presently does. The Tribe would continue to operate the Yoosa Creek hatchery in the Lolo Creek watershed.

There would be no effect to roadless area characteristics in the Moose Mountain Roadless Area.

2.1.2 Alternative 2: Proposed Action

Alternative 2 would allow for the approval of proposed Plans of Operation in specified reaches of Lolo Creek and Moose Creek (including two tributaries, Independence Creek and Deadwood Creek). The Plans of Operations include specified design features described below. These were derived from public comments, government-to-government consultation with the Nez Perce Tribe, and consultation with other government agencies (Appendix D). Endangered Species Act consultation was completed for all proposed activities. The maximum number of operations approved in any year under this analysis is 18 for Lolo Creek and 38 for Moose Creek. These numbers correspond with the maximums listed in the USFWS and NOAA Biological Opinions. Proposed operations that do not meet the following operating conditions, design features and mitigation measures would require re-initiation of consultation with USFWS and/or NOAA and a separate

environmental analysis. The active mining claims and areas in which plans of operations may be approved are shown in Figure 2-1 for Lolo Creek and Figure 2-2 for Moose Creek. The study areas are located as follows:

Lolo Creek

14 to 17 miles southeast of Pierce, Idaho,

in portions of:

- T. 34 N., R. 6 E., Section 5
- T. 35 N., R. 6 E., Sections 10, 16, 17, 20, 29, and 32, Boise Meridian.

All portions of the Lolo Creek study area border Clearwater County and Idaho County

Moose Creek
(and tributaries Deadwood Creek and Independence Creek)

Approximately 12 miles east of
Kelly Forks Work Center in portions of:

- T. 39 N., R. 11 E., Sections 4 and 9
- T. 40 N., R. 11 E., Sections 29, 31, 32, 33, Boise Meridian, Clearwater County, Idaho

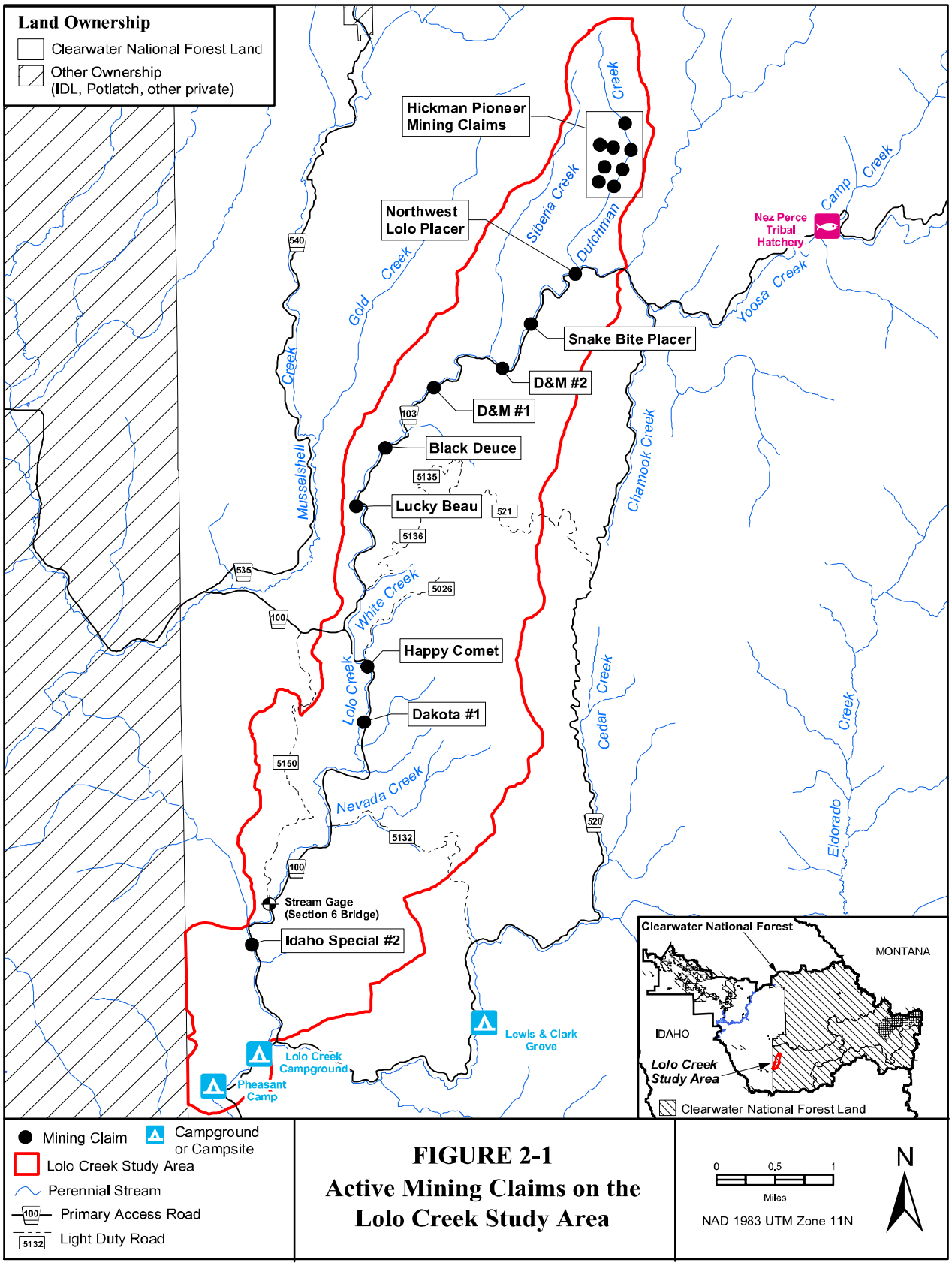


Figure 2-1. Active Mining Claims on the Lolo Creek Study Area

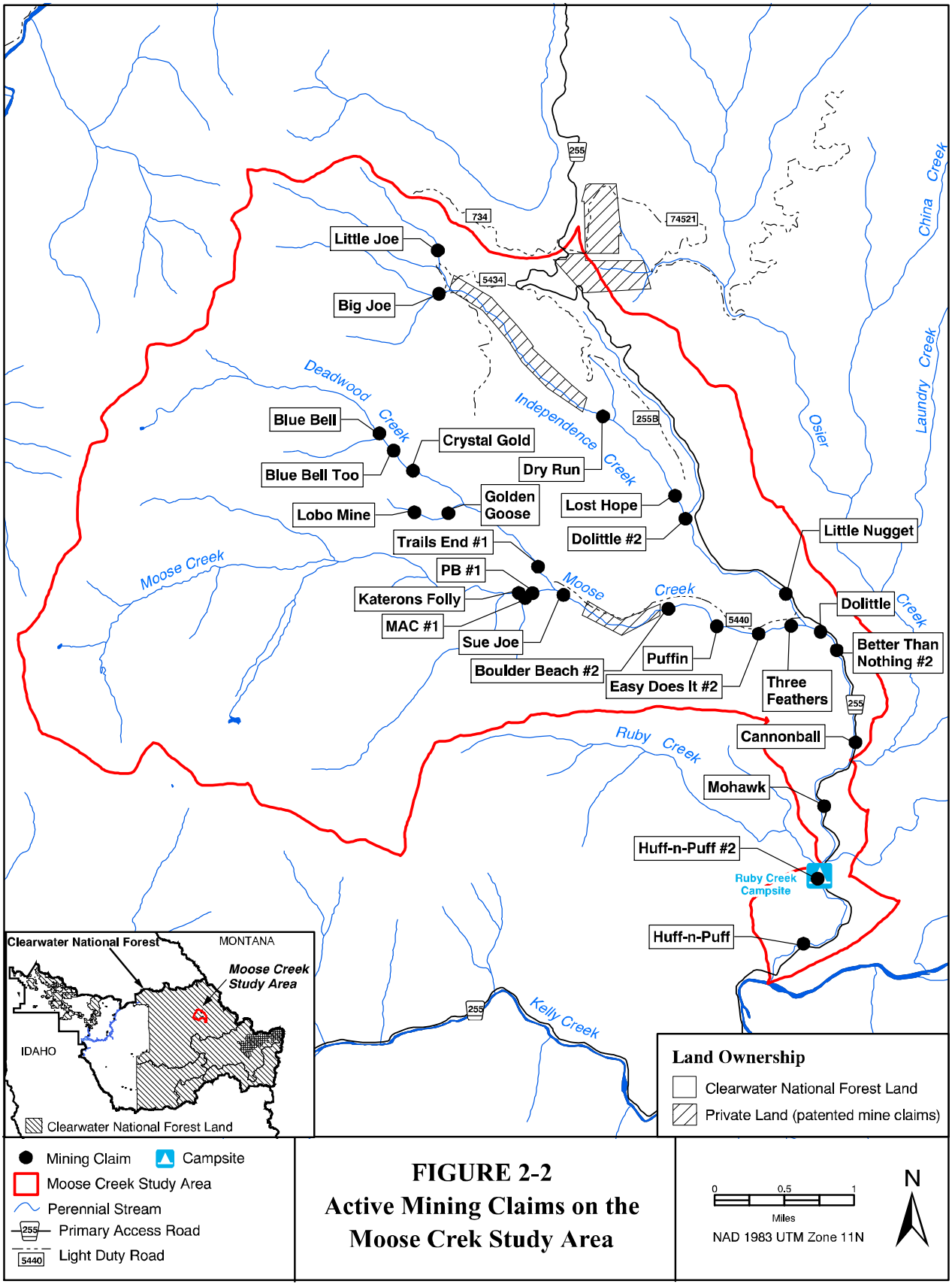


Figure 2-2. Active Mining Claims on the Moose Creek Study Area

2.1.3 Alternative 3: Suction Dredging and Stream Improvement Projects

This alternative is the same as Alternative 2, except that it includes a stream improvement project. This alternative was developed from internal concerns regarding chronic streambank and water quality impacts from the Lolo #5 abandoned mine site in Lolo Creek. Alternative 3 is the preferred alternative.

The stream improvement project involves bank stabilization and reclamation of the abandoned Lolo #5 mining claim on Lolo Creek (see Figure 2-3). Lolo #5 was placer mined by backhoes and dozers in the late 1970s, and the site was never reclaimed. The overburden and placer tailings bermed along the west bank of the creek have remained unstable and continue to be a major contributor of fine sediment to the stream system (Clearwater BioStudies, 1999a). The mitigation project would stabilize and reclaim approximately 950 feet of Lolo Creek, and would include the following components:

- Remove and/or recontour sediment producing overburden and tailings berm.
- Armor, and revegetate with native species as needed to provide a stable non-erodable stream bank along the west bank of Lolo Creek.
- Recontour and revegetate as needed existing overburden and tailings stockpiles away from existing emergent wetlands.

The restoration project would not take place during critical salmonid spawning or migration periods and would follow all appropriate construction Best Management Practices (IDL, 1992) to control erosion and minimize short-term impacts due to construction.

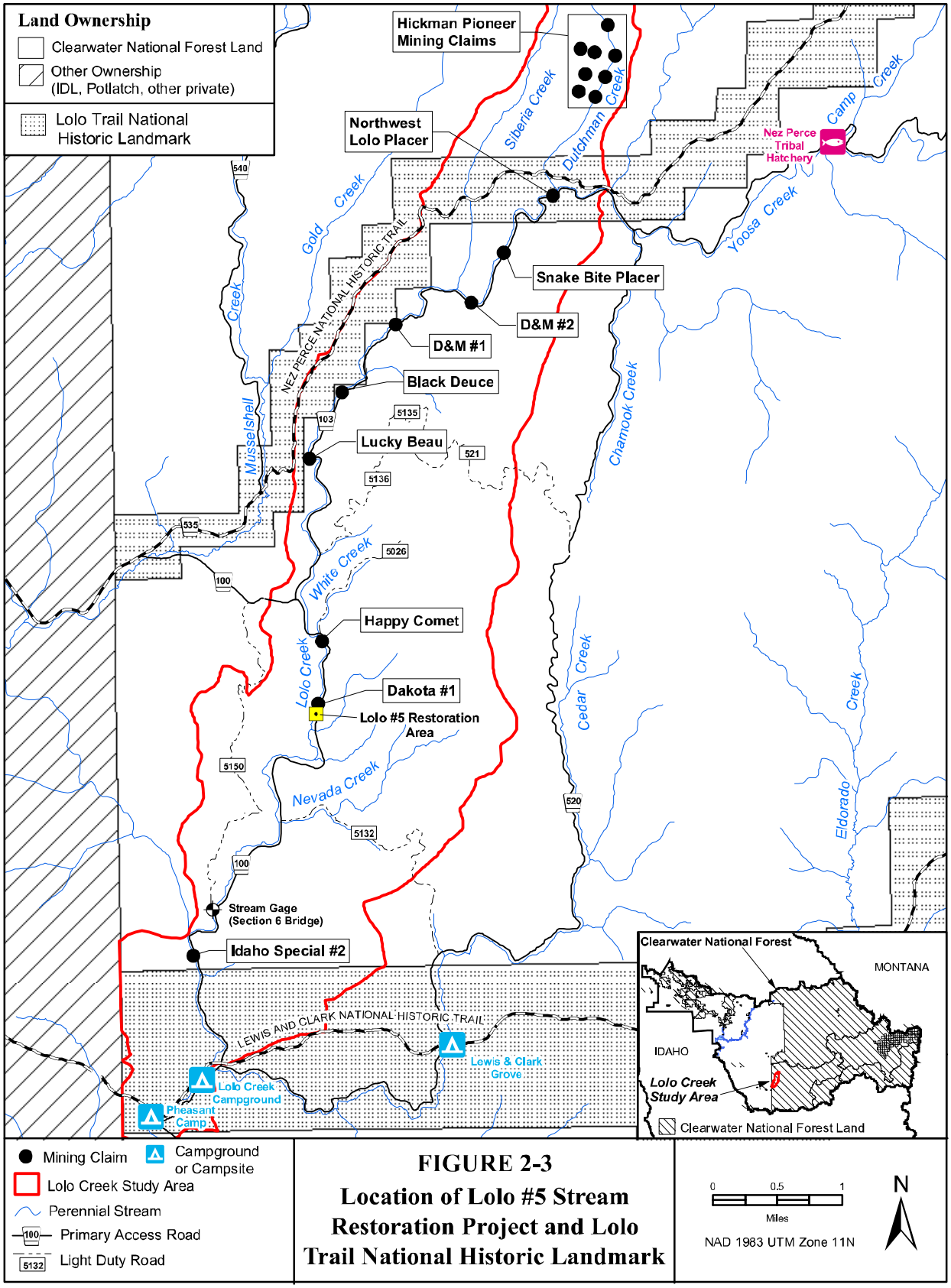


Figure 2-3. Location of Lolo #5 Mine Reclamation and Improvement Project and Lolo Trail National Historic Landmark

2.1.4 Operating Conditions, Design Features, Terms and Conditions and Mitigation Measures Common to Both Action Alternatives

Both action alternatives would include the following operating conditions, design features and mitigation measures. These measures include Idaho Department of Water Resources (2007) BMPs for suction dredging, NMFS (2009) and U.S. Fish and Wildlife Service (2008) non-discretionary reasonable and prudent measures to avoid or minimize take.

1. Operations may occur only within the wetted perimeter below the ordinary high water line during a dredge season extending from July 1 (July 15 – Lolo Creek) through August 15.

2. Before dredge mining begins, operators must submit a Plan of Operations to the Forest Service that specifies the location, approximate amount of surface area they plan to dredge, and likely dates of operation. The operating plan would be used to establish channel-monitoring sites, and is not intended to constrain the timing and location of dredge operations.

3. Prior to dredging, operators must meet with a Forest Service fisheries biologist who would inspect the proposed dredge sites. No dredging would be allowed in areas of known bull trout (or steelhead, in the case of Lolo Creek) spawning or in areas identified as spawning habitat. Miners would also avoid identified Lolo Creek lamprey spawning areas.

4. The suction dredge may have a nozzle diameter of 5 inches or less and a horsepower rating of 15 horsepower or less.

5. Pump intakes must be covered with 3/32-mesh screen.

6. Dredge sites must be located in areas of large substrate not preferred for spawning steelhead trout and bull trout, and operators are required to conduct all dredge mining 50 feet or more from identified spawning areas.

7. Dredging operations must take place during daylight hours.

8. Dredging must be conducted in a manner so as to prevent the undercutting and destabilization of stream banks, and may not otherwise disturb streambanks.

9. If streambanks are disturbed in any way, they must be restored to the original contour and revegetated with native species at the end of the dredging season.

10. Camping areas, paths, and other disturbed sites that are located along stream banks and that are associated with dredge operations must be re-vegetated or otherwise restored to their original conditions at the end of the dredge season.

11. Operators must cease activities during wet periods when project activities are causing excessive ground disturbance (visible ground disturbance due to soil saturation) or excessive damage (muddying/rutting) to roads.

12. Dredges must not operate in such a way that the current or the discharge from the sluice is directed into the bank in a way that causes erosion or destruction of the natural form of the channel, that undercuts the bank, or that widens the channel.

13. Operators may not undermine, excavate, or remove any stable woody debris or boulders that extend from the bank into the channel. This would prevent destabilization of streambanks and the stream channel.

14. Operators may not remove, relocate, or disturb stable in-stream woody debris or boulders greater than 12 inches in diameter unless it was determined during the pre-mining site review that the predominate substrate was 12 inches and retaining larger boulders would be more beneficial to that particular reach. This design feature would prevent the destabilization of the stream channel and assure that potential fish habitat would not be disturbed.

15. The operator would not remove any large down or standing woody debris or trees for firewood within one tree length of the stream.

16. Operators may not move cobbles in the stream course to the extent that the deepest and fastest portion of the stream channel (i.e., the thalweg) is altered or moved.

17. No mechanized equipment may be operated below the mean high water mark except for the dredge itself and any life support system necessary to operate the dredge. No mechanized equipment other than the suction dredge may be used for conducting operations.

18. Dredging may not dam the stream channel.

19. Dredges may not operate in the gravel bar areas at the tails of pools.

20. Dredges may not operate in such a way that fine sediment from the dredge discharge blankets gravel bars.

21. Operators must visually monitor the stream for 150 feet downstream of the dredging operation. If noticeable turbidity is observed downstream, the operation must cease immediately or decrease in intensity until no increase in turbidity is observed 150 feet downstream.

22. Shallow areas must be restored to their original grade each day and natural pools may not be filled. Tailings must be redistributed to avoid creating unstable spawning gravels.

23. All dredge piles must be dispersed and backfill all dredge holes before moving to a new dredge location and by the end of the operating season, no later than August 15.

24. Dredging operations must shut down immediately if any sick, injured, or dead specimen of a threatened or endangered species is found. The finder must notify the Vancouver Field Office of NOAA Law Enforcement at (360) 418-4246 for steelhead trout, or USFWS Division of Law Enforcement at (208) 378-5333 for bull trout. The finder must take care in handling sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition. The finder must also ensure that evidence intrinsic to the specimen is not disturbed unnecessarily. In addition, if any fish eggs are excavated or if destruction of redds is observed, operators must contact the CNF and receive authorization to proceed prior to resuming operations. Operators must record the date, time, location, and possible cause of fish injury or death.

25. Operators must maintain a minimum spacing of at least 150 linear feet of stream channel between suction dredging operations.

26. Gasoline and other petroleum products must be stored in spill-proof containers at a location that minimizes the opportunity for accidental spillage.

27. The suction dredge must be checked for leaks, and all leaks repaired, prior to the start of operations each day. The fuel container used for refueling must contain less fuel than the amount needed to fill the tank. The suction dredge must be anchored to the stream bank when refueling in the water, so that fuel does not need to be carried out into the stream. Unless the dredge has a detachable fuel tank, operators may transfer no more than one (1) gallon of fuel at a time during refilling. Operators must use a funnel while pouring, and place an absorbent material such as a towel under the fuel tank to catch any spillage from refueling operations. A spill kit must be available in case of accidental spills. Soil contaminated by spilled petroleum products, must be excavated to the depth of saturation and removed from the National Forest for proper disposal.

28. Operators would not entrain, mobilize, or disperse any mercury discovered during mining operations. Operators must cease operations and notify the Forest Service if mercury is encountered in dredged material. Operators may not use mercury, cyanide, or any other hazardous or refined substance to recover or concentrate gold.

29. All human waste must be kept more than 200 feet away from any live water. All refuse from dredging activities must be packed out and disposed of properly.

30. Operators must obtain all Idaho and Federal permits including the Environmental Protection Agency's NPDES permit, the Corps of Engineers/State of Idaho's joint 404/ Permit to Alter a Stream Channel, and State 401 certification. Operators must also comply with all additional conditions or measures stipulated in the permits, and must comply with the State of Idaho's Placer Mining - Best Management Practices (IDWR, 2004).

31. Heritage resource surveys were conducted in compliance with the National Historic Preservations Act, and various sites were identified in the area. If additional heritage resources are found during the implementation of the project, project activities are to cease. The Forest Archaeologist would be notified, and an assessment would be made regarding the effect of continued activities on the newly identified heritage resource.

32. To prevent the threat of aquatic invasive species, Suction dredges, tools used while dredging, and associated equipment must be thoroughly cleaned with a Pressure washer and dried at least 5 days prior to use on the National Forest.

2.1.5 Monitoring Requirements Common to Both Action Alternatives

Both action alternatives would include the following monitoring and reporting requirements. These are based on the reasonable and prudent measures in the 2008-2009 Biological Opinions, and would be reported to the USFWS and NOAA.

1. Prior to July 1, an interagency field trip would be held to review the mining sites with local miners to determine if any additional mitigation or terms and conditions would be needed to avoid impacts to listed species. In addition to the Level One team members, representatives from the Idaho Department of Fish and Game, Idaho Department of Water Resources, and Nez Perce Tribe would be invited to attend (USFS 2008a and 2008b).
2. The Forest Service would review all proposed suction dredge plans of operations prior to approving the proposed action. The Forest Service shall determine if the extent and effects of the action are consistent with the BA (USFS 2008b), and if not, the Forest Service must reinitiate consultation immediately.
3. The Forest Service would require each operator include a written statement listing and accepting all mitigation and terms and conditions as part of their Plan of Operations prior to approving implementation of their suction dredging operation.
4. Visit each dredge site at least five times between July 1 (July 15 for Lolo Creek) and August 15, or more often if problems occur, to monitor dredge activity, and effects of the mining on fish and fish habitat.
5. Monitor potential changes in channel morphology as a result of mining through specific measures specified in the Biological Opinion.
6. Upon notice by an operator under item 24 above of dead or injured threatened or endangered species, or if eggs are excavated, the Forest Service would consult with NOAA Law Enforcement Office in the Vancouver Field Office or USFWS Division of Law Enforcement, prior to authorizing a resumption of dredging.
7. Provide annual monitoring report to USFWS within 90 days of the end of the dredging season, and to NOAA by November 30 that describes operator compliance with suction dredging rules, the amount of stream area mined at each site, a photo of the mined area, and details about stream bank disturbance and re-vegetation, if any.
8. Provide NOAA and USFWS with an update of pre-season monitoring no later than June 15, and a report on post-season monitoring progress no later than September 15.

9. At the end of the operating season, no later than September 15, the operator must provide CNF a description of the actual location(s) of the operation, the surface areas dredged, and the number of days operated.

2.2 Alternatives Eliminated from Detailed Consideration

The IDT and decision maker considered 3 alternatives, including the no-action alternative. This provides a reasonable range of alternatives 940 CFR 1502.14(a). Each alternative was reviewed to determine if it: (1) met the purpose and need; (2) addressed the issues; (3) whether or not the alternative was feasible; and (4) whether or not the alternative was consistent with the Forest Plan, laws and regulations. The following alternatives were eliminated from detailed study for the reasons described below:

2.2.1 Alternative 4 - Withdrawal of Special Areas from Mining

A commentor suggested that the Forest Service withdraw all Riparian Habitat Conservation Areas (RHCAs), potentially eligible streams for National Wild and Scenic Rivers, and/or all areas that contain special features. Withdrawn lands are closed to mineral entry under the mining laws. This alternative was not carried forward because it is not consistent with the purpose and need to develop operating conditions that protect surface resources so that the plans of operations can be approved. This alternative is not in compliance with the 1872 Mining law and Forest Service minerals regulations at 36 CFR 228.4(f).

PACFISH direction does not preclude mining activities in RHCAs. It does require a reclamation plan, and an approved plan of operations. Reclamation bonding is discretionary. However, a bond would be required if the District Ranger determines that the proposed surface disturbance is of such that assurance is needed. See PACFISH standard and guide MM-1. Proposed activities are also consistent with standard MM-6 for the inspection, monitoring and reporting for mineral activities.

Proposed project areas do not lie within designated Wild or Scenic Rivers. Neither Moose Creek nor Lolo Creek have been recommended for Wild and Scenic River eligibility. Forest Plan standards for managing minerals within Wild and Scenic River corridors require mitigation of mineral extraction on visual, recreation and water resources.

2.2.2 Alternative 5 – Operation Specific NEPA Analyses

A commentor argued that the Forest Service should conduct an environmental analysis for each small-scale suction dredging operation in these creeks. Separate analyses would require cumulative consideration of all other suction dredging activities as they are similar actions. This Draft SEIS evaluated the impacts of multiple operations and considered all the impacts that a series of operation-specific NEPA analyses would evaluate. CEQ regulations require that similar, connected and cumulative actions are considered during analysis. Therefore, it is appropriate to analyze all suction dredging operations under one EIS.

2.3 Comparison of Alternatives

This section provides a summary of the potential effects to each resource that would result from implementation of each alternative considered in detail. Table 2-1 summarizes the findings in Chapter 4 for each alternative in Lolo Creek and Moose Creek, respectively, and allows a comparison of potential impacts among the alternatives.

Each alternative has been evaluated for its effects on the resources based on the key issue that drove the development of the alternative. Issue indicators are parameters used to measure the effect of each alternative on the resources emphasized by the issue.

The original proposed action was formulated considering an array of internal issues, including effects to water quality, aquatic habitat and species, riparian wildlife and plants, recreation, visual and cultural resources, tribal treaty rights and roadless areas.

Table 2-1: Alternative Comparison by Issue

Resource Issue ♦ *Issue Indicator*	*Potential Impacts Unique to Alternative(s)*		
	Alternative 1: No Action	*Alternative 2: Proposed Action*	*Alternative 3: Stream Improvement Projects*
Water Quality			
♦ Increases in sediment	erosion of unstable stream banks at Lolo #5 mine site would continue	no increase from terrestrial sources; existing instream sediment moved from one location to another but no increase in overall sediment	slight increase from terrestrial sources at Lolo #5 mine; long term reduction at this site; existing instream sediment moved from one location to another but no increase in overall sediment
♦ Increase in turbidity	no effect; IDEQ standards would continue to be met	slight increase during 45 day (30 day for Lolo Creek) operation period but would not exceed IDEQ state standards	slight increase during 45 day (30 day for Lolo Creek) operation period but would not exceed IDEQ state standards
Aquatic Habitat and Species (including TES, Invertebrates and amphibians)			
♦ Increase in sediment	erosion of unstable stream banks at Lolo #5 mine site would continue with minimal effects to species	no increase from terrestrial sediment; existing instream sediment moved from one location to another; low risk to species	slight increase from terrestrial sources at Lolo #5 mine; long term reduction at this site; existing instream sediment moved from one location to another but no increase in overall sediment; low risk to species
♦ Increase in turbidity	no effect; IDEQ standards would continue to be met	slight increase may affect feeding but risk is low due to short daily and annual duration	slight increase may affect feeding but risk is low due to short daily and annual duration
♦ Changes to pool frequency and quality	no effect	no change since mining not permitted or preferred in large natural pools	no change since mining not permitted or preferred in large natural pools
♦ Stream bank stability	no change; bank stability remains fair at Lolo #5 mine site	no change; bank stability remains fair at Lolo #5 mine site; minimal effects to fish species from Lolo #5 site	long term improvement of bank stability at Lolo #5 mine site; minimal effects to fish species during reclamation
♦ Degradation to spawning gravels	no effect	dredging not permitted in prime spawning habitat; minimal effects expected	dredging not permitted in prime spawning habitat; minimal effects expected
♦ Direct mortality to aquatic species	no effect	slight potential for fish; higher for aquatic insects; overall would not affect populations	slight potential for fish; higher for aquatic insects; overall would not affect populations

Table 2-1: Alternative Comparison by Issue			
Resource Issue ♦ *Issue Indicator*	*Potential Impacts Unique to Alternative(s)*		
	Alternative 1: No Action	*Alternative 2: Proposed Action*	*Alternative 3: Stream Improvement Projects*
Riparian Wildlife and Plants			
♦ Sensitive wildlife species	no effect	no reduction in habitat; avoidance caused by disturbance would last during 45 day (30 day for Lolo Creek) season and average 5 hours per day; minimal effects to wildlife based on disturbance; potential mortality to amphibians but risk is low due to low numbers of animals	no reduction in habitat; avoidance caused by disturbance would last during 45 day (30 day for Lolo Creek) season and average 5 hours per day; minimal effects to wildlife based on disturbance; potential mortality to amphibian but risk is low due to low numbers of animals
♦ Sensitive plant species	no effect	no reduction in habitat; potential trampling by miners; effects expected to be limited due use of existing trails by miners and expected low populations of plants	no reduction in habitat; potential trampling by miners; effects expected to be limited due use of existing trails by miners and expected low populations of plants; plants not expected to be affected by Lolo #5 mine reclamation
Recreational Opportunities and Visual Resources			
♦ Recreational opportunities	no effect	minor impacts to fishing, camping and hiking due to limited 45 day (30 day for Lolo Creek) mining season, and small area affected. No impact to hunting opportunities due to season restrictions. Dredging noise could have minor, limited impacts to users of the Nez Perce Trail near Lucky Beau claim	minor impacts to fishing, camping and hiking due to limited 45 day (30 day for Lolo Creek) mining season, and small area affected. No impact to hunting opportunities due to season restrictions. Dredging noise could have minor, limited impacts to users of the Nez Perce Trail near Lucky Beau claim
Nez Perce Tribal Treaty rights			
♦ Tribal hunting	no effect	avoidance by game may occur but duration is 5 hours per day for 45 days (30 day for Lolo Creek); no effect expected as game have suitable habitat nearby	avoidance by game may occur but duration is 5 hours per day for 45 days (30 day for Lolo Creek); no effect expected as game have suitable habitat nearby
♦ Anadromous and resident fish species as measured by sediment, turbidity, pool frequency and quality, bank stability, spawning gravel quality and direct mortality to fish	no effect	minimal effects based on turbidity increases and direct mortality of fish; would not effect survival of the species, especially chinook salmon	minimal effects based on turbidity increases and direct mortality of fish; would not effect survival of the species, especially chinook salmon
♦ Gathering activities	no effect	no expected effects	no effects expected

Table 2-1: Alternative Comparison by Issue

Resource Issue ♦ *Issue Indicator*	*Potential Impacts Unique to Alternative(s)*		
	Alternative 1: No Action	*Alternative 2: Proposed Action*	*Alternative 3: Stream Improvement Projects*
Roadless Areas			
♦ High quality or undisturbed soil, water, and air	no effect	minimal effect for 45 days (30 day for Lolo Creek) to water; no effect to undisturbed soils or air	minimal effect for 45 days(30 day for Lolo Creek); no effect to undisturbed soils or air
♦ Sources of public drinking water	no effect	no effect	no effect
♦ Diversity of plant and animal communities	no effect	minimal 45 day (30 day for Lolo Creek) effects to wildlife from avoiding dredge areas; minimal effects to plants from potential trampling	minimal 45 day (30 day for Lolo Creek) effects to wildlife from avoiding dredge areas; minimal effects to plants from potential trampling
♦ Habitat for TES, proposed, candidate, and sensitive species	no effect	minimal potential effect to sensitive plant species and ESA listed fish species	minimal potential effect to sensitive plant species and ESA listed fish species
♦ Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation	no effect	minimal effects from noise due to short duration of season and average 5 hours per day of operation; localized to area near stream	minimal effects from noise due to short duration of season and average 5 hours per day of operation; localized to area near stream
♦ Reference landscapes	no effect	no effect	no effect
♦ Natural appearing landscapes with high scenic quality	no effect	minimal effect for 45 day (30 day for Lolo Creek) dredging season and only near stream; no effect to remainder of area; no change in vegetation	minimal effect for 45 day (30 day for Lolo Creek) dredging season and only near stream; no effect to remainder of area; no change in vegetation
♦ Traditional cultural properties and sacred sites	no effect	no effect	no effect
♦ Other locally identified unique characteristics	no effect	no effect	no effect

3.0 Affected Environment

This chapter describes the baseline (existing) conditions against which environmental effects can be evaluated with the implementation of any of the action alternatives. Most of the environmental descriptions in this chapter reference specialist reports and technical data contained in the project file.

3.1 Water Quality

3.1.1 Lolo Creek

The physical bounds of this analysis are the reaches of Lolo and Dutchman Creek as shown in Chapter 2. They extend downstream to Lolo Creek where it meets the Forest Boundary. Lolo Creek is a major tributary to the Clearwater River. The confluence is located near Greer, Idaho (see Figure 1-1 in Chapter 1). The only streams potentially affected by the project are the mainstem of Lolo Creek from the Forest boundary to Dutchman Creek and the mainstem of Dutchman Creek itself. There are 14.2 square miles of the Lolo Creek watershed within the analysis area.

There are approximately 24.7 miles of perennial streams within analysis area. Of that, Lolo Creek accounts for 11.6 miles and Dutchman 2 miles. Parts of Lolo Creek were placer mined in the 1970s and early 1980s with heavy equipment, including the abandoned Lolo #5 mining claim (see Figure 2-3). The mined area has not been reclaimed and this reach of the creek contains approximately 950 feet of unstable banks (USFS 2002a). Dutchman Creek was also placer mined in the past and still shows evidence of some instability along the stream banks in one reach of the stream. The Forest Plan standard for Lolo Creek is "steelhead high fishable, C channel" and the standard for Dutchman Creek is "basic".

The State of Idaho has not listed specific beneficial uses for Lolo Creek, however all undesignated waters have cold water aquatic life and primary and secondary contact recreation designations. The Forest Plan identifies steelhead trout and cutthroat trout as the beneficial uses for the Lolo Creek watershed (USFS 1987). Fish population surveys show that steelhead, cutthroat, and bull trout, spring Chinook salmon, whitefish and brook trout are present in Lolo Creek. In addition, the Nez Perce Tribe spring Chinook rearing facility is located along Camp Creek and uses water from both Camp and Yoosa creeks. The hatchery is just upstream from the upper end of the analysis area.

There are no impaired waters in the project area as listed in the EPA approved 2008 Idaho Department of Environmental Quality Integrated Report.

A Total Maximum Daily Load (TMDL) could potentially be developed for 3 Lolo Creek tributaries, all of which lie outside the project area. A TMDL ultimately establishes a scientifically-based-strategy for correcting the impairment and restoring the water body to designated uses. IDEQ has identified the following water bodies within the Lolo Creek drainage as those where load allocations may be applicable: Eldorado, Jim Brown, and Musselshell drainages (IDEQ, pers. comm., 2009). These water bodies would be further assessed for their 303(d) list impairment parameters to determine if load allocations are necessary. The mainstem of Lolo Creek was not included in the listed water bodies so no load allocations would be applied. Recreational suction dredging is considered a non-point source for pollution by IDEQ.

Sediment

Stream surveys (Clearwater Biostudies, 1998) indicate that bank stability at the abandoned Lolo #5 mining claim was rated as fair while all other reaches were good to excellent. Cobble embeddedness levels (i.e., the amount of sediment surrounding cobbles in the substrate) for Lolo Creek were 46% which exceeds the Forest Service's Desired Future Condition of 30 to 35 percent (USFS 1987). In general, the levels of cobble embeddedness in Lolo Creek are associated with natural conditions and past management activities (USFS 2002a) such as road construction, timber harvest, and grazing. There is no way to determine how much is attributed to natural conditions and how much is attributed to past management activities. Cobble embeddedness levels for Dutchman Creek were 77%. There is no turbidity data for Dutchman Creek.

Numerous monitoring studies have been conducted by Clearwater National Forest to evaluate sediment levels and particle size distributions in the substrate of Lolo Creek. Wolman pebble counts (Wolman 1954) were collected in the summer of 1998 in Lolo Creek below Yoosa Creek, above White Creek and below Nevada Creek (USFS 2002a). These data indicate that a 17% of the surface substrate consists of sands, silts, and clays, while a majority of the material is made up of larger gravels, cobbles and rock. This is considered moderate when compared to the guidelines developed through ESA consultation. A high rating would have surface fines <10% for moderate (Rosgen B) gradient channels. A moderate rating is 11-20%, and a low rating is >20% or less for surface fines. Forest monitoring also indicates that sediment levels are on an improving trend (USFS, 2005). This is due to improving channel substrate conditions, watershed recovery from past activities and application of best management practices including PACFISH buffers.

Turbidity

Turbidity has been monitored during peak flows using an ISCO sampler at the Section 6 Bridge on Lolo Creek since 1986. Monitoring during this time frame captures the highest possible turbidity levels within any water year. Turbidity results from an increase of suspended fine sediment that reduces water clarity. The State of Idaho standard states that background turbidity levels cannot be increased by more than 50 nephelometric turbidity units (NTU) instantaneously or 25 NTU for more than 10 days (IDEQ 2007). Results show low levels of turbidity ranging from a maximum low of 4 to a maximum high of 24 NTUs. These turbidity data represent nearly 1,000 samples collected since 1986, all of which remain well below the State turbidity standard of 50 NTU. This shows that even at the highest flows of the year when the highest levels of sediment are moving, state standards were not exceeded and that sediment production in Lolo Creek is meeting State water quality standards.

3.1.2 Moose Creek

The physical bounds of Moose Creek portion of the analysis are the reaches of Moose Creek, Independence Creek, and Deadwood creek as shown in Chapter 2. The downstream extent is at the confluence of Moose Creek and Kelly Creek. The environmental baseline data for Moose, Deadwood and Independence Creeks was determined by survey data collected in 2003 (Clearwater BioStudies, Inc. 2004). Surveys had also been conducted in 1990.

Moose Creek is a major tributary of lower Kelly Creek, which is itself a major tributary of the upper North Fork Clearwater River. Independence and Deadwood Creeks are two major tributaries of Moose Creek. There are approximately 34.3 miles of perennial streams within the project area. A total of 19.1 miles are contained within actual project activity streams. They include: Moose Creek (10.2 miles with 0.6 on private lands), Independence Creek (5.1 miles with 1.3 miles on private land), and Deadwood Creek (3.8 miles).

Sixty-one percent of the Moose Creek watershed is considered roadless, but other parts have been impacted by extensive mining, road construction, and timber harvest on both USFS and private lands. Deadwood and Independence Creeks were heavily placer mined beginning in the 1860s and continuing to the 1950s. Both dragline dredging and hydraulic mining were employed. Moose Creek was mined with a dragline in the 1940s and 1950s. About 5 miles of Moose Creek experienced dragline mining. Figure 3-5 shows a dragline in operation along Moose Creek. Evidence of historic placer mining is also present in smaller tributaries to Moose Creek, Craig Creek and McCloskey Creek. Some areas of the Moose Creek watershed were privately owned until 1996, when most private lands, with the exception of four patented mining claims parcels, were transferred to the USFS. Two of the patented claims are in the study area, including 98 acres along 1.3 miles of Independence Creek and 36 acres along a 0.6 mile segment of Moose Creek. The Forest Plan standard for most of Moose Creek is a “C channel type, cutthroat high fishable” stream (USFS 1987).

Mining in Deadwood Creek was primarily in the floodplain, and activities such as dredging and the use of flash dams for hydraulic mining altered channel characteristics, channel stability and substrate composition. Sediments produced in this watershed tend to deposit in the channel. The Forest Plan standard for Deadwood Creek is a “B channel type, cutthroat high fishable” stream (USFS 1987).

Mining in Independence Creek occurred primarily in the creek itself and the floodplain adjacent to the creek and its tributaries. Activities such as dredging and the construction of stream diversions altered

channel characteristics and channel stability (USFS 1994a). A diversion that was built to redirect water from the East to the West Fork of Independence Creek causes significant erosion from the hillslopes that were cut during construction. Sediments produced in Independence Creek tend to deposit in the channel, and surveys conducted noted high amounts of fine sediments in the channel (USFS 1994a). The Forest Plan standard for Independence Creek is "basic".

(Source: Manchester and Sievers 1957)

Figure 3-1. Dragline and Washer Operation on Moose Creek

IDEQ has not listed any beneficial uses for Moose Creek or its tributaries, however all undesignated waters have cold water aquatic life and primary and secondary contact recreation designations. There are no IDEQ water quality limited streams in the Moose Creek study area.

Sediment

Sediments produced in the Moose Creek watershed from logging and road construction tend to be transported out of the watershed because of a relatively high energy system (USFS 1994a).

Surveys for Moose Creek were conducted in 2003 and in 1990. The 2003 survey was used to determine if any channel changes resulted from the 1995-96 flood events. The data shows that substrate conditions remained the same upstream of Deadwood Creek. Substrate conditions showed a slight improvement in the reaches immediately downstream of Deadwood Creek. Cobble embeddedness levels decreased 3% from Deadwood Creek to Independence Creek and 8% immediately downstream of Independence Creek. The lower reaches of Moose Creek below Osier Creek showed increases in cobble embeddedness (2-8%) which is expected due to the lower gradient and depositional characteristics of these reaches and the recent landslide history, especially in Deadwood Creek. Cobble embeddedness for Moose Creek is currently at 28% which meets the Forest Plan desired levels for sediment (<30%).

Surveys indicate that streambanks are unstable in most areas where past dragline mining occurred.

Cobble embeddedness levels in Deadwood Creek showed an increase from 16% in 1990 to 32% in 2003. The increase is most likely due to the six landslides that occurred during the 1995/96 flood events. These landslides originated from the existing road network in the headwaters and deposited unknown amounts of sediment into several tributaries of Deadwood Creek. The sediment deposits are being transported downstream into the lower reach of Deadwood Creek. Substrate conditions in the lower reach of Deadwood Creek do not meet the Forest Plan desired conditions. Current cobble embeddedness levels are 32% which exceeds the desired condition of 25-30%.

Independence Creek showed a moderate improvement of substrate conditions with cobble embeddedness levels decreasing from 43% in 1990 to 32% in 2003. Substrate conditions within the lower reach of Inde-

pendence Creek meet the Forest Plan desired conditions for the "moderate fishable" standard (<45%) which is more restrictive than the "basic" standard assigned to it.

Turbidity

Turbidity was monitored on Moose Creek between 1979 and 1981. The data shows relatively low levels of suspended and total sediment load. From 1979 to 1981 the suction dredge season ran from July 1 through September 30. During this time the data show ranges from 0.7 NTU to 1.8 NTU. Overall, turbidity levels range between 0.7 and 4.3 NTU and were well under the State turbidity standard of 50 NTU above background. Turbidity data show that sediment production in Moose Creek is meeting State water quality standards.

Turbidity was measured on Deadwood Creek in 1981 (USFS 1993b). Turbidity levels ranged between 0.7 and 1.9 NTU which is well under the State turbidity standard of 50 NTU. Turbidity data show that sediment production in Deadwood Creek is meeting State water quality standards.

Turbidity was measured on Independence Creek in 1981. Levels range between 1.1 and 5.2 NTU and are well under the State turbidity standard of 50 NTU above background (IDEQ 2000). Turbidity data show that sediment production in Independence Creek is meeting State water quality standards.

3.2 Aquatic Habitat and Species

3.2.1 Aquatic Habitat

Aquatic habitat conditions have been altered in the analysis area by past mining, grazing, road construction, and timber harvest. Below is a summary of the existing conditions based on habitat surveys that were conducted on Lolo Creek (Clearwater Biostudies, 1998), Dutchman Creek (Isabella Wildlife Works, 1994), Moose, Deadwood, and Independence Creeks (Clearwater Biostudies, 2004). This is the most recent data available. The two factors that influence the quality and quantity of aquatic habitats are large boulders and large woody debris. These structures provide local stability to a channel, control stream gradient, flow direction, or produce localized pools or cover for aquatic organisms. Pools are important for fish rearing habitat. Riffle habitats and the tail ends of pools provide spawning habitat for fish and habitat for aquatic insects. The amount and size of substrate also influences the quality and quantity of spawning and rearing habitat. Small sands and silts can fill the spaces between the larger substrates which reduce the amounts of available habitat. Gravels with minimal amounts of sand and silt are the preferred substrate for spawning. Both gravels and cobbles provide good rearing habitats.

Lolo and Dutchman Creeks

Lolo Creek is a low gradient (1-2%) stream channel dominated by pools (61%). Banks are very stable and there are 4 pieces of instream wood and 13 pieces of riparian wood (standing trees) per 100 meters of stream. These are well below Forest Plan desired conditions and are partly due to the meadow habitats in much of the stream system. Meadows are typically not capable of growing dense stands of trees due to high water tables. Pool quality in Lolo Creek is good and instream cover is moderate. Bank cover in the form of large wood or live vegetation is sparse. Substrate is dominated by cobble and larger substrates (83%), followed by gravel (12%) and sand and silt (5%). The large size of the substrate limits spawning habitat for steelhead to 12% of the area, chinook spawing to 9% of the area and just 2% to resident cutthroat trout. The large substrate provides excellent rearing habitat for all species.

Dutchman Creek has a moderate gradient (5%) and is dominated by pool habitats (64%). Bank stability is rated as good and there are 62 pieces of instream and 30 pieces of riparian wood per 100 meters of stream. Desired conditions for instream wood are exceeded while riparian wood levels are not met. Pool quality is rated as fair to poor due to high sediment levels. Bank cover is good and substrate is dominated by sand (55%) followed by gravel and larger particles (44%). No anadromous fish spawning habitat was identified, however 8% of the area provides resident fish spawning. Most of the stream provides summer rearing and only 5% was identified for winter rearing.

Stream temperatures were monitored to evaluate habitat conditions for steelhead trout, spring chinook salmon, westslope cutthroat trout and bull trout. Lolo Creek exceeded the State standards for cold-water

biota for 8 days. It did not meet any of the Forest Plan standards for any fish species. Dutchman Creek was monitored and meets the Forest Plan standard for steelhead trout rearing. None of the remaining standards were met on Dutchman Creek.

Moose, Deadwood, and Independence Creeks
Upstream of the Deadwood Creek confluence Moose Creek contains steep to very steep gradients and excellent fish habitat. Between the mouths of Deadwood Creek and Independence Creek, the gradient is moderately steep with habitat affected by past placer mining. Between the mouths of Independence Creek and Osier Creek, the gradient is moderately-steep to steep, and below Osier the gradients are low.

Moose Creek is dominated by riffle habitats (59%). Banks are stable and there are 6 pieces of instream wood and 20 pieces of riparian wood (standing trees) per 100 meters of stream. These are well below Forest Plan desired conditions. Pool quality in Moose Creek is poor and instream and bank cover is sparse. Substrate is dominated by cobble and larger substrates (91%). This substrate provides very limited spawning-sized gravels for salmonids but provides good rearing habitat.

Stream temperatures were monitored in Moose Creek to evaluate habitat conditions for westslope cutthroat trout and bull trout. Moose Creek met the State standard for cold-water biota of 22°. It did not meet the State standard of 13° for bull trout. It did not meet the Forest Plan standard for either species.

Deadwood Creek is a moderate gradient (5.5%) stream channel dominated by riffles (63%). Banks are very stable and there are 23 pieces of instream wood and 72 pieces of riparian wood (standing trees) per 100 meters of stream. These are below Forest Plan desired conditions. Pool quality in Deadwood Creek is poor and instream and bank cover is sparse. Substrate is dominated by cobble and larger substrates (72%), followed by gravel (26%). This includes potential spawning habitat in both dredging and non-dredging areas.

Stream temperatures were monitored Deadwood Creek. This stream met the State standards for cold-water biota. It just exceeded the State bull trout standard by less than one degree during the spawning and incubation seasons. It exceeded it during the rearing season. It did not meet the Forest Plan standards for either fish species.

Independence Creek is a low gradient (3.2%) stream channel dominated by riffles (51%). Banks are stable and there are 17 pieces of instream wood and 20 pieces of riparian wood (standing trees) per 100 meters of stream. These are below Forest Plan desired conditions. Pool quality in Independence Creek is poor and instream cover is sparse. Bank cover is moderate. Substrate is dominated by cobble and larger substrates (55%), followed by gravel (41%).

Stream temperatures were monitored in Independence Creek. This stream met the State standards for cold-water biota. It did not meet any of the Forest Plan standards for either fish species.

Survey and monitoring data indicate that the limiting factors for Moose, Deadwood, and Independence Creeks are the lack of large acting woody debris, low number of pools and poor pool quality.

The data indicate that less than one-half of one percent of the total stream habitat in Moose, Deadwood, and Independence Creek is available for salmonid spawning. This includes potential spawning habitat in both dredging and non-dredging areas.

3.2.2 Aquatic Species

Spring-run chinook salmon are a Regional Foresters sensitive species and occur in Lolo Creek. They require streams with large substrate (3-6" diameter) and low gradients. Concentrated spawning areas occur along Lolo Creek up to Yoosa Creek. Juvenile rearing occurs in all of the Lolo Creek mainstem and a few of its tributaries. Juveniles prefer pool-type habitats for rearing. State, Federal, and Nez Perce Tribe hatchery stocking of chinook adults has occurred in Lolo Creek over the last ten years. Densities of juveniles vary depending on the amount of returning adults. Results have been variable over the 10 year period. Supplementation continues to occur through the Tribal hatchery facility. There are no spring chinook salmon in Moose Creek due to the presence of Dworshak Dam over 100 miles downstream. This dam is a total barrier to anadromous fish.

Fall chinook salmon do no occur in Lolo Creek. There are no historical records or current documentation of this ESA listed threatened species. There is no designated critical habitat for them on the Clearwater National Forest. The closest critical habitat is located over 25 miles downstream, on the mainstem of the Clearwater River below the town of Greer, Idaho. There are no fall chinook salmon in Moose Creek due to the presence of Dworshak Dam over 100 miles downstream. This dam is a total barrier to anadromous fish. Fall chinook would not be discussed further in this environmental assessment as they do not occur in the project area.

Steelhead trout are listed as threatened under ESA. These fish spawn in the spring from March to May. Fish typically spawn in moderate gradient (3-5%) streams. The eggs hatch in about 35-50 days. Alevins remain in the gravel 2 to 3 weeks before they emerge as fry in late spring and begin to actively feed. Steelhead trout usually remain in streams for 2- or 3-years prior to migrating to the ocean (USFS 1999).

Steelhead trout prefer to rear in complex habitats created by large and small wood and/or boulders and rock. Juveniles may move around in a basin to take advantage of favorable habitat. Fry prefer protected and complex edge habitat with low velocities (<0.3 ft/s), and are seldom observed in water over 15 inches deep. Summer rearing of young fish takes place in small and deep scour pools with some form of surface cover and wood or medium to large substrate. Other important habitat components for juveniles are pools with "bubble curtains" undercut/scoured areas, and pocket water in deep riffles and rapids. Winter rearing occurs more uniformly at lower densities across a wide range of fast and slow habitat types.

The Lolo Creek drainage produces very few steelhead trout due to overall low adult returns and habitat conditions. Adult and juvenile plantings have occurred over the past 20 years. Steelhead trout mostly spawn in the mainstem of Lolo Creek (from Musselshell Creek to Yoosa Creek) and possibly a few other accessible tributaries in upper Lolo Creek drainage.

Juvenile steelhead rearing has been documented in the mainstem of Lolo Creek. Fish population surveys over the past 22 years have found juvenile steelhead trout at most sampling sites. The data suggests that production has been in a static to downward trend in the Lolo Creek system. Densities of juvenile steelhead were 0.4 fish/100 square meters in 2005. This underscores the very low adult escapement and/or spawning in the drainage. The likelihood of wild steelhead adults spawning in Lolo Creek is considered very low and is probably under 100 spawning pairs (USFS 2002a). As a result, there is more spawning and rearing habitat available than there are fish to fill it.

There are no steelhead trout in Moose Creek due to the presence of Dworshak Dam over 100 miles downstream. This dam is a total barrier to anadromous fish.

Bull trout were listed as a threatened species under ESA (63 FR 31647) in 1998. In 2005, a new Final Rule was published in the Federal Register (70 FR 56212). The Final Rule excluded areas that were already covered by approved conservation agreements and habitat management plans; the Clearwater River Subbasin was excluded from critical habitat designation due to the implementation of PACFISH/INFISH buffers on federal lands.

Bull trout are found in cold-water streams and rivers. They can be resident or migratory. Bull trout spawning occurs in clear, headwater streams with a gravel or rubble bottom. Spawning begins when stream temperatures fall to between five and nine degrees Celsius, which would normally be from mid-August to November. Eggs hatch in January and the fry remain within the gravel until early spring. Some juveniles would migrate to larger rivers by mid-summer. Other juveniles may rear in tributary streams for three to four years before moving to larger streams and rivers (USFS 1999).

Although the Lolo Creek drainage was probably within the historical range of bull trout, populations have since been largely extirpated. No documented spawning or rearing of bull trout has occurred in the Lolo Creek drainage over the past several years (USFS 1999). Past monitoring by federal, state, and tribal biologists showed two juvenile bull trout in 1987, and a total of 15 fish from 1990, 1993-1995, 1998-2000,and 2003-2004 surveys. No fish were observed in 1996-1997, 2001-2002, or from 2005-2007.

The extent of bull trout spawning and production is considered very low. Habitat conditions and warmer temperature regimes appear to limit bull trout production in the Lolo Creek drainage. The 1999 survey of nine streams in the watershed found that temperatures in each of these streams exceeded the desired bull

trout rearing temperature of 10 ºC or below. Other than temperature, habitat conditions in upper Lolo Creek would allow for bull trout spawning. The Lolo Creek drainage has been designated an adjunct watershed for future bull trout recovery efforts (USFS 1999).

Bull trout occur in relatively low numbers in the Moose Creek drainage. Spawning ground surveys were conducted on Moose Creek from 2005 to 2007. No redds or spawning activity were observed. Snorkel surveys were conducted by the Forest between 1983 and 2006, and only one or two bull trout were observed at 15 stations. Fish population surveys conducted by the Idaho Department of Environmental Quality (IDEQ) and Nez Perce Tribe (NPT) found only 2 juvenile bull trout in Little Moose Creek and Pollack Creek. A total of 19 fish were documented for all surveys combined between 1983 and 2006. No bull trout have been found in either Deadwood or Independence Creeks.

Westslope cutthroat are a sensitive species with a very wide distribution. They can be found in streams with channels as narrow as 18 inches. The highest densities are found in the small tributary streams, and in the mid and upper reaches of the larger streams where competition with other trout or salmon species is limited (USFS, 1999). Cutthroat spawning occurs in pool tailouts and in small pockets with 0.5- to 2-inch diameter gravels. Rearing occurs in pools, along stream margins, and in pocket water habitats.

Rearing and spawning habitat for westslope cutthroat is present throughout the Lolo Creek drainage (USFS 2008c). Presence has been primarily documented in most Lolo Creek tributaries outside the range of steelhead trout. Most cutthroat observed are of small size and are considered resident fish. Densities range from low to very high (up to 16 age 2+ fish/100m^2). Cutthroat were only observed in the mainstem of Lolo Creek in reaches above the project area. Surveys throughout the Clearwater National Forest indicate that cutthroat prefer the tributaries over the mainstem habitat. This is most likely due to the smaller spawning gravels available in the tributaries.

Cutthroat trout are the dominant species and have a wide distribution in the Moose Creek drainage. Their densities average 2.8 (age 2+) fish per 100m^2 (Clearwater BioStudies Inc. 1990) which is considered a strong population. High densities were observed in the reaches above the dredging operations. There were low densities with the middle portions of Moose Creek where most dredging occurs. There were moderate densities in the lower reaches below Osier Creek. The Forest Plan for Moose Creek identifies cutthroat trout as a management indicator species (USFS 1987). Cutthroat were observed in Independence Creeks.

Pacific lamprey is listed as a sensitive species and is listed by the Idaho Department of Fish and Game as a State endangered species. Pacific lamprey are anadromous and return to streams to spawn from April to July, after which time they die. Juvenile lamprey embed themselves in sand-dominated, low-gradient channels where they filter-feed and grow. They typically rear in these areas for up to seven years before migrating to the ocean to become parasitic on various ocean fish (Moser and Close 2003). Some sandy spawning habitat for lamprey occurs within the mainstem of Lolo Creek. Nez Perce Tribe monitoring has documented both juvenile and young adult lampreys in Lolo Creek (USDOE 1997). There is no documentation of lamprey occurring within the project area. Recent Snake River dam counts indicate a declining trend in lamprey numbers.

There are no Pacific lamprey in Moose Creek due to the presence of Dworshak Dam over 100 miles downstream. This dam is a total barrier to anadromous fish

Mussels are known to occur in Lolo Creek, but densities are unknown. Snorkel surveys have found small random groups. Preferred habitats are sandy substrate often in the bottom of pools or sandy areas mixed with small gravels generally near the margins of the stream. The highest concentrations occur in Musselshell Creek, just outside of the project area. Mussels are filter feeders that are relatively stationary and do not move about much. There is no aquatic invertebrate survey data that is relevant to assessing potential impacts as a result of suction dredging operations or to adequately describe invertebrate baseline conditions within the project areas.

Aquatic insects are a primary food source of juvenile salmon and trout, and other fish in Lolo Creek. The presence, distribution, and abundance of aquatic insects are dependent upon water temperature, water quality and chemistry, substrate, and flow. In general, the four most important aquatic insect groups or that comprise the diet of many fish include true flies, mayflies, caddisflies, and stoneflies. Limited data exists for Lolo Creek, however one station located near Musselshell Creek was surveyed by IDEQ in July

1995. A Macroinvertebrate Biotic Integrity (MBI) score of 3.94 was calculated (IDEQ 1996). A score greater than 3.5 indicates that the macroinvertebrate community is not impaired and therefore similar to background reference conditions.

There is no aquatic insect data for Moose, Deadwood, or Independence Creeks.

3.2.3 Riparian Wildlife and Plants in Lolo and Moose Creeks

There are a variety of wildlife and plant species that occur in the Lolo and Moose Creek drainages. Only those that may occur within or use riparian areas within the project areas would be discussed as the proposed activities are not expected to affect species outside those areas. Visual observations of the species or the availability of their habitat was used to determine the likelihood of their presence. A review of Idaho Conservation Data Center information was also completed for many of the species.

Camping, fishing and road use occur throughout the project areas and may affect riparian wildlife and plants through disturbance or direct mortality. Dispersed camping occurs along both Lolo and Moose Creeks. Campers include the suction dredgers and other recreators. Use is low to moderate and is based on the number of camping areas available. Fishing occurs throughout the summer but does not occur in large numbers in either Lolo or Moose Creeks. Vehicle use is available on about 13 miles of open road near Lolo Creek (Forest Roads 100 and 103) and 10 miles near Moose Creek (Forest Roads 255 and 5440). Use is moderate during the dredging season as Road 100 and 255 are primary access routes through the forest.

3.2.3.1 Riparian Wildlife

The following species would not be discussed as they or their habitat do not occur within the analysis area or they would not be affected by proposed activities: Townsends big-eared bat, wolverine, northern goshawk, flammulated owl, black-backed woodpecker, bald eagle, harlequin duck, Couer d'Alene salamander and ring neck snaked. Please see the Wildlife Specialist report in the project file for more information.

Mammals. There are no ESA listed species within the Lolo Creek analysis area. Canada lynx is the only ESA listed species within the Moose Creek analysis area; however, the project area does not contain suitable denning habitat for lynx. For both areas, CNF management indicator species include white-tailed deer, elk, moose, and American marten. Fishers and gray wolf are sensitive species. Fishers use areas near streams and are likely present. Home range estimates range from 1-15 mi^2 for females and 5-30 mi^2 for males (Heinemeyer and Jones, 1994). Most studies suggest that fishers are tolerant of some level of human activity. Wolves are known to occupy both project areas but no denning sites are known to occur near proposed activities. Moose and white tailed deer are common users of riparian areas in both analysis areas.

Birds. Pileated woodpeckers, belted kingfishers, and northern goshawk are management indicator species. Though pileated woodpeckers and goshawk may forage in riparian areas, they are not likely to use them for nesting. Belted kingfishers however, nest in riparian vegetation and feed on fish. They are common inhabitants of riparian areas.

Amphibians. Suitable habitat exists for boreal toads and Idaho giant salamanders in the Lolo and Moose Creek areas, though no population data exists. Both species require standing or quite backwaters for laying eggs and terrestrial habitats for the adult life stage. The breeding season for boreal toads goes from May to July and for salamanders in the spring and fall. Toad tadpoles metamorphose and dispersed within 2 months. Juvenile giant salamanders spend several years in streams prior to metamorphosing. It is likely that both these species occur in Lolo and Moose Creek riparian areas near proposed dredging activities.

It is likely that Idaho giant salamanders occupy Lolo, Moose, Deadwood, and Independence Creeks although no sightings have been documented. Couer d'Alene salamanders have been observed downstream of the Moose Creek project area along Kelly Creek. These salamanders prefer spray zones near small water falls. They do not likely occur near dredging activities due to a lack of waterfalls.

3.2.3.2 Riparian Plants

The riparian area along Lolo Creek is predominantly forested wetlands with a dominant community type of western red cedar/ladyfern. Associated species include grand fir, Engelmann spruce, Douglas fir, mountain

ash, willow, common snowberry, dogwood, Sitka alder, devil's club, western thimbleberry, queencup, beadlily, arrowleaf, groundsel, starflowered Solomon's seal, plume grass, and pine grass. Stream surveys indicate that 44% of riparian areas contain large or mature trees. Riparian Stream surveys indicate that 44% of riparian areas contain trees over 15" diameter. Cedar trees make of 40% of the dominant species and conifers in general dominate 65% of the area.

The riparian habitats along Moose Creek vary considerably but are comprised mostly of mixed shrubs with alder, spruce, and mixed conifer trees. Mature conifers (e.g., spruce, lodgepole pine, grand fir, and Douglas fir) generally dominate along upper reaches of the creek and deciduous species (alder, cottonwood, and willow) usually dominate in the lower reaches of the creek. Alder and spruce are the dominant canopy species, followed by mixed conifers and willows. Associated understory species include huckleberry, dogwood, forbs, grasses, and meadow communities.

The riparian canopy in Independence Creek is dominated by alder, followed by spruce and mixed conifers. Forbs/grasses, mixed shrubs are the dominant understory along with young conifers.

Deadwood Creek is dominated by spruce, mixed conifers, cedar grand fir and alder trees. Understory vegetation along the streams is comprised of mixed shrubs, forbs/grasses, and small alder.

There is no suitable habitat and no documentation of water howellia, an ESA listed plant, in the Lolo, Moose, Independence or Deadwood Creek project areas.

The following sensitive plants will not be discussed as they do not occur within riparian areas and would not be affected by proposed activities: Green bug-on-a-stick, Henderson's sedge, cup lichen, Light moss, Licorice fern, Naked mnium, Short-styled triantha, and Idaho strawberry.

Sensitive plants that may occur within both project area riparian areas include: deer fern, mingan moonwart, bristle-stalked sedge, Idaho strawberry and Clustered lady's slipper.

Noxious weeds are mostly associated with disturbed open, dry site areas. Knapweed, St. Johnswart, and small amounts of houndstongue occur along Forest Road 103 in the Lolo Creek project area. Knapweed and St. Johnswart occur along Forest Road 255 in the Moose Creek project area. Most do not occur directly adjacent to streams due to thick riparian grasses, sedges, and cedar trees which shade the riparian areas.

The Lolo #5 mining claim is dominated by wetlands or areas that historically would have been classified as wetlands but were drastically disturbed by mining. Currently emergent wetlands have formed in parts of the old channel where it was dredged. However, the majority of the area is dominated by abandoned tailings piles. Small amounts of willow and other wetland species can be observed in the area, but for the most part, the piles do not contain wetland vegetation. The Lolo Creek stream banks at this site are also lacking the appropriate riparian vegetation and root mass to provide shading and bank stability.

3.2.4 Recreation Opportunities in Lolo and Moose Creeks

The Forest Service manages recreation by guidelines set forth in the Recreation Opportunity Spectrum (ROS) (USFS 1994b). The ROS provides a framework by which outdoor recreation environments, activities, and experience opportunities can be organized and defined. The ROS established six classes that reflect the range of possible settings from primitive to urban. An area's class is determined by a combination of remoteness, naturalness (level of human modification), social setting (number of encounters with people) and degree of visitor controls.

3.2.4.1 Recreation

The Lolo and Moose Creek areas are managed as "Roaded Natural" (USFS 1987). Both areas are characterized by mostly natural-appearing landscapes as viewed from sensitive roads and trails, with Moose Creek providing more of a semi-primitive recreational experience than Lolo Creek. There is one developed campsite in the vicinity of the Lolo Creek area; none in Moose Creek. Operators camp in the undeveloped, dispersed sites. They do not use the Lolo Creek Campground. Moose Creek, due to its more remote location, has fewer visitors than Lolo Creek. Small undeveloped dispersed camping sites are located throughout both project areas, including on mining claims. These areas are primitive (i.e., no amenities) and are generally used by hunters and miners in the area.

The Lolo Creek area is popular for day users to pick berries, look for firewood and general picnicking. Peak use is during the summer months, with the hunting season extending from late August to early November. In the Moose Creek area, dispersed recreation activities occur year-round, but the majority of activity occurs during snow-free months from mid-May to early November. Roads and trails are not maintained during winter. Little use occurs from mid-November to mid-May although a few hardy snowmobilers travel Roads 247 and 250 to sightsee.

Recreation opportunities in both project areas include fishing, hunting, camping, and hiking, as well as suction dredge mining. Cutthroat trout and brook trout are the only species that can be fished for in the mainstem of Lolo Creek. No cutthroat were observed during surveys. Brook trout occur in very low numbers. The amount of potential fishing on Lolo Creek is considered very low as a result. Fishing pressure is low to moderate in Moose Creek and primarily occurs downstream from Osier Creek. The majority of fishing occurs in Kelly Creek and mainstem North Fork Clearwater River due to trophy sized fish that occur there. Moose Creek does not offer the same opportunities as the other two streams.

Two prominent trails are located in or near the Lolo Creek project area, the Lewis and Clark National Historic Trail and the Nez Perce (Nee-Me-Poo) National Historic Trail. Lolo Creek is accessed by Forest Service Roads 100 and 500. Road 100 provides access to the western portal of the historic Lolo Motorway. Lolo Trail Road 500 is a main road that extends from Road 100 east to U.S. Highway 12. Beyond Canyon Junction, Road 500 becomes a primitive native surfaced road known as the Lolo Motorway within the Lolo Trail National Historic Landmark. Forest Road 103, which parallels Lolo Creek in the upper portion of the study area is also considered a high use recreation road to access the area.

Moose Creek is accessed by Deception Saddle Road 255. This arterial route extends from Road 250 at Kelly Forks to Road 250 near Deception Creek. Most visitors use this road to access the Kelly Forks Campground and other dispersed recreation sites. It also serves as a haul route for timber management in the area.

3.2.5 Roadless Areas

The Idaho Roadless Rule was promulgated on October 16, 2008 (73 FR 61456) and established management direction for designated roadless areas in the State of Idaho. Under this Draft SEIS, proposed suction dredging activities would take place on 19 mining claims within the Moose Mountain Roadless Area, which is managed under primitive and backcountry/restoration themes. Eighteen claims lie within the Backcountry restoration theme, one lies within the primitive theme. There are no roadless areas listed within or adjacent to the Lolo Creek study area.

The Moose Mountain Roadless Area lies between Kelly Creek and the North Fork of the Clearwater River and readily accessed from either the Pierce-Superior Road 250 or the Kelly Creek – Deception Road 255. This 22,000 acre roadless area forms a triangle bounded by these two roads and a clearcut. Appendix C of the CNF Plan EIS contains a complete description of the Moose Mountain Roadless Area, along with its resources and values, the range of alternative land uses considered in that document, and the effects of alternative management scenarios.

Under the Clearwater Forest Plan direction, the Moose Mountain Roadless Area is managed as Dispersed Recreation in Unroaded Setting under Management Area A3. The 1987 CNF Plan Record of Decision did not recommend this area for wilderness because of its small size and nature of the area. Its wilderness attributes do not compare to those of the Mallard-Larkins and Hoodoo Roadless Areas.

Forest Roads 255 and 5440 provide access to the majority of the proposed dredging sites. Mining claims on Upper Deadwood Creek are accessed by hiking from the end of Forest Road 5434. Mining claims and dredge sites located upstream of the Deadwood/Moose Creeks confluence would be accessed by Trail 690. This trail is closed yearlong to motorized use (CNF Travel Guide 2005 and Travel Planning and the OHV rule). Operators use existing roads and trails to access their claims. Remote claims off existing roads and trails within the roadless area would be accessed by foot by miners. Miners are not given permission to use those roads closed or restricted to the general public.

Lands within the roadless boundary are public domain lands open to entry under the General Mining Law of 1872. Under the Idaho Roadless Rule, nothing in the rule shall affect mining activities conducted pursuant to the General Mining Law of 1872 (36 CFR 294.25(b)). Miners have the right to reasonable access to

prospect and explore for valuable minerals on lands open to mineral entry. The following roadless area characteristics as defined in 36 CFR 294.21 under the Idaho Roadless rule, are resources or features that are often present in and characterize Idaho Roadless Areas.

1) *High quality or undisturbed soil, water, and air:* The area provides for high quality undisturbed soil, water and air due to the lack of management activities.

2) *Sources of public drinking water:* There are no designated sources of public drinking water within the roadless area.

3) *Diversity of plant and animal communities:* The area provides a diversity of plant and animal communities. All of the area provides elk summer range.

4) *Habitat for threatened, endangered, proposed, candidate, and sensitive species, and for those species dependent on large, undisturbed areas of land*: The area provides habitat for threatened and sensitive species. Refer to the previous discussion in this chapter for fisheries, wildlife and plants.

5) *Primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation:* The Recreation Opportunity Spectrum for 31% of this area is roaded natural. The remainder of the roadless area is semi-primitive nonmotorized.

6) *Reference landscapes:* The area provides for reference landscapes due to the lack of human activities.

7) *Natural appearing landscapes with high scenic quality:* The area is surrounded on two sides by a road and on one side by extensive timber harvesting. Viewing of these developments, as well as the sound of vehicles and timber harvesting activities, is possible throughout much of the area. Other mining activity, the area has retained is natural integrity and appearance.

8) *Traditional cultural properties and sacred sites:* Current cultural resource sites include cabins or cabin remains, hunting camps, prehistoric campsite and several mining sites.

9) *Other locally identified unique characteristics:* There are no locally identified unique characteristics in this roadless area.

3.3 Native American Treaty Rights and Traditional Uses

The Nez Perce Tribe has retained fishing rights at all “usual and accustomed places” and hunting, gathering and pasturing rights on “open and unclaimed land’ as per the terms of their 1855 treaty with the United States. The Nez Perce Tribe historically used the entire CNF for such uses. These rights are thus reserved within the CNF and the Lolo and Moose Creek analysis areas for this project. In addition, the Lolo and Moose Creek analysis areas lie within the 1855 Treaty boundary.

The Lolo and Moose Creek project areas are important to the Nez Perce Tribe as areas rich in tribal tradition for gathering of cultural plants, hunting, fishing, camping and religious activity. The areas are important to the Nez Perce people who value access to their traditional land use areas.

Campers could occupy traditional fishing, hunting or gathering areas or create noise that could displace game species. Fishermen could occupy tribal fishing areas; however, the likelihood is low in Lolo Creek since fish populations are low. Berry-pickers could occupy traditional gathering areas. The likelihood is low as there are few berry patches in the areas near the suction dredgers. Most occur in more upland habitats.

Laws, Regulations, and Designations: Historical, cultural, and traditional properties in the Lolo Creek and Moose Creek watersheds are regulated by a number of federal laws and regulations, including the National Historic Preservation Act, 36 CFR 800 – Protection of Historical and Cultural Properties, the American Indian Religious Freedom Act, the Archaeological Resource Protection Act, and the Native American Graves Protection and Repatriation Act.

Clearwater National Forest Plan: Forest Plan direction is to protect Indian tribal rights as retained in treaties and other agreements, and to protect religious ceremonial sites, and hunting, gathering and fishing rights. Other agency plans to direct the Forest Service to work closely with area Indian tribes to achieve mutual goals and objectives, and to insure that trust responsibilities of Indian treaties are honored.

The Nez Perce Tribe has identified salmon as an integral part of tribal religion, culture, and physical sustenance, and has indicated that the annual return of the salmon allows the transfer of traditional values from generation to generation (CRITFC 2002). The tribe has further indicated that Lolo Creek is an important stream in restoration efforts for chinook salmon in the Clearwater River Subbasin (Mancuso 1996). The Yoosa Creek tributary of upper Lolo Creek, 1.5 miles upstream of the Lolo Creek study area, is the location of a satellite facility site for the Nez Perce tribal hatchery program. The Tribe also maintains a weir to facilitate the removal of chinook adults for spawning and future egg taking. The weir lies about one-half mile below the Lucky Beau claim. Spring chinook adults and juveniles are present in Lolo Creek during the July 15 to August 15 suction dredge season. There are no anadromous fish in Moose Creek.

4.0 Environmental Consequences

This chapter describes the potential direct, indirect and cumulative environmental consequences of implementing each alternative. The descriptions of potential impacts are organized by resource area.

4.1 Potential Effects on Water Quality

4.1.1 Alternative 1: No Action

Sediment and Turbidity

There would be no direct effects to Lolo Creek or Moose Creek resulting from a lack of dredging activities. Indirectly, erosion of unstable stream banks at the Lolo #5 mine site would continue to be a source of low amounts of sediment to the creek. Low levels of sediment and turbidity would continue to be caused by roads and camping activities near both Lolo and Moose Creeks.

Lolo Creek would continue to not meet desired conditions for cobble embeddedness although the exiting improving trend is likely to continue. Lolo Creek would continue to meet State standards for turbidity.

There would be no project related change to the listed State water quality parameters of bacteria, nutrients, sediment, or temperature in Lolo Creek since no activities would occur. Moose and Independence Creeks would continue to meet State standards and Forest Plan desired conditions. Deadwood Creek would continue to meet turbidity standards. Cobble embeddedness levels in Deadwood Creek are likely to continue to decrease towards meeting Forest Plan desired levels over time as road related landslide sediment works its way down stream and out of the system.

Cumulative Effects

There would be no direct or indirect effects, and therefore no cumulative effects to sediment or turbidity in Lolo or Moose Creeks as a result of the no action alternative. Cumulative effects can only arise from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. There are no actions associated with this alternative.

4.1.2 Alternative 2: Proposed Action

Sediment and Turbidity

No terrestrial sediment would be disturbed from streambanks or other sources outside the stream channel with this alternative. Therefore there would be no direct or indirect increase in instream sediment into the Lolo or Moose Creek study areas. Dredging approved under this alternative would be limited to the wetted perimeter of the stream channel. Dredging would only relocate existing instream sediment by pulling it from the substrate, passing it through the suction dredge, and replacing it into the creek. It would then settle out within less than 150 feet from the dredge. No new sediment would be added. This alternative would comply with the Forest Plan Stipulation Agreement even though the agreement only applies to timber harvest activities. Cobble embeddedness levels would decrease where dredges operate and may increase slightly downstream from dredge holes as sediment is moved from one location to the other. Decreases and increases would be localized and therefore overall cobble embeddedness levels are not expected not change.

Turbidity levels would increase slightly downstream while the dredges are working in all project activity areas. Idaho turbidity standards require that background turbidity levels not be increased by more than 50 NTUs instantaneously or 25 NTU for more than 10 days (IDEQ, 2007). The degree that turbidity is increased by dredging is variable and dependent on the amount of very fine streambed sediments and the velocity of the stream flow. Small dredges typically do not create long plumes of turbidity. Suction dredges operate primarily in areas with larger substrate where heavier particles and gold are typically found. The larger particles tend to settle rapidly, which limits sediment plumes to short distances from the sluice outlet. Thomas (1985) found that suspended sediment concentration returned to background levels 35 feet downstream fro the dredge. IDEQ measured turbidity of small-scale suction dredges immediately behind the sluice outlet, turbidity did not exceed the state acute standard of 50 NTU (D. Stewart, IDEQ, pers.

Comm.). IDEQ measured turbidity from small-scale suction dredges operating in the South Fork of the Clearwater River. Turbidity downstream of each suction dredge increased only slightly. Although sporadic plumes were sometimes visible 150 feet downstream, samples collected around 150 feet downstream of the suction dredge all met Idaho State standards and were below the 5 NTU over background turbidity requirement (IDEQ 2001). Turbidity levels for this project are expected to remain low, of short duration (only while dredges are operating), and short distance (less than 150 feet). They are not expected to exceed State standards based on past monitoring and the fact that even during the high flows of spring when turbidity highest, standards were not exceeded. Operators must cease dredging if visible turbidity extends more than 150 downstream of the dredge.

Field reviews were conducted during the 2001 mining season in Lolo Creek by the Forest to assess the effectiveness of the design features at the time. Those features were similar to proposed design features for this alternative. No problems or violations with the mining permits were observed. Tribal fisheries personnel working within the Lolo Creek drainage also did not observe any problems with suction dredging activities in 2001. A follow-up field review was held in August 2001 with regulatory and miners. With the exception of some obvious movement of substrate materials at various mining sites, no riparian or stream bank alterations were observed and the mining sites were restored.

There would be no measurable project related change to the listed State water quality parameters of bacteria, nutrients, sediment, or temperature in Lolo Creek. All human waste must be at least 200 feet from the stream channel which would minimize bacteria or nutrient input. Sediment levels would not be increased as mentioned above. Dredging activities would not affect stream temperature as they function no differently than the flowing water in the stream. Flowing streams typically have relatively constant temperatures throughout the water column unless there are large ground water inputs into the system. Both Lolo and Moose Creeks are relatively shallow during the summer and are not expected to have stratified layers of temperature due to the constant movement of the stream.

Cumulative Effects to Lolo Creek

There are no direct or indirect effects to instream sediment levels from terrestrial sediment input resulting from dredging operations. There would be no overall increase in instream sediment since it would only be moved from one location to the next. Dredging has no direct or indirect effects and therefore no potential for cumulative effects to instream sediment levels when combined with other activities.

There would be localized increases to turbidity at each dredging site; however, turbidity levels are not expected to exceed Idaho state water quality standards. Since the standard would not be exceeded for dredging, there would be no potential for cumulative effects to turbidity when combined with other activities.

Cumulative Effects to Moose Creek

There are no direct or indirect effects to instream sediment levels from terrestrial sediment input resulting from dredging operations. There would be no overall increase in instream sediment since it would only be moved from one location to the next. Dredging has no direct or indirect effects and therefore no potential for cumulative effects to instream sediment levels when combined with other activities.

The area assessed for cumulative effects to turbidity include the mainstem of Independence Creek to Moose Creek. This area was selected since an area larger than this would dilute the effects and make them immeasurable. The activities considered for cumulative effects on turbidity are the suction dredging on the 6 claims in Independence Creek and the installation of the Independence Creek ford. The time frame is 2 weeks which is the estimated time it would take to finish the installation of ford.

Both of these activities can increase turbidity. The low water crossing at Independence Creek will be reconstructed. The new crossing will either be a vented ford or a low bridge that can be overtopped during high flows. Vehicles would no longer travel in the water to cross the stream. Turbidity would be increased during the construction of the structure when stream bottom substrate is disturbed during structure placement.

The replacement of the Independence Creek ford would increase turbidity levels during the same time frame as dredgers in Independence Creek. The duration is short term both in the number of days (14) and the number of hours per day (10 or less). It is also possible that dredges would not be operating or would operate minimally during this time frame. Turbidity monitoring for suction dredging has shown that State standard for turbidity has not been exceeded and the direct effects from the ford construction is short duration. Since the standard has not been exceeded, it is assumed that the risk for cumulative effects from the combined activities is very low. There would be long term positive effect to reducing turbidity since vehicles using the ford would no longer be driving in the stream.

4.1.3 Alternative 3: Suction Dredging and Stream Improvement Project

Potential impacts from suction dredging to sediment and turbidity this alternative would be the same as under Alternative 2. However, there would be a temporary and short term increase in sediment levels in Lolo Creek from the Lolo #5 reclamation project. This would result from the recontouring of streambanks to a more stable slope. Erosion control measures such as erosion barriers and low flow instream work periods would be implemented to minimize sediment input. Over the several years, there would be a permanent reduction in sediment from this reach of Lolo Creek as the streambanks become vegetated and stabilize.

This alternative would comply with the Forest Plan Stipulation Agreement and State water quality standards as mentioned in Alterative 2.

Cumulative Effects

The cumulative effects to sediment and turbidity from this alternative in Lolo Creek would not be any different than those from Alternative 2. The minor amounts of sediment that would be added as a result of the Lolo #5 mine reclamation would not increase the risk of cumulative effects over Alternative 2. Very minor positive cumulative effects would be associated with the reduction in sediment input from streambanks that are stabilized at the site.

4.2 Potential Effects on Aquatic Habitat and Species

4.2.1 Aquatic Habitat

4.2.1.1 Alternative 1: No Action

There would be no direct project related change to bank stability, pool quality or quantity, or spawning gravels in Lolo Creek or Moose Creek since no activities would occur. Bank stability at the Lolo #5 mine site however would continue to be rated as fair. This site has not stabilized on its own since mining activities ceased in 1980s. It is not likely to stabilize in the foreseeable future.

Cumulative Effects

There are no direct or indirect, and therefore no cumulative effects, associated with this alternative. Cumulative effects can only arise from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. There are no actions associated with this alternative.

4.2.1.2 Alternative 2: Proposed Action

There would be no direct effects to bank stability or pool quantity or quality in Lolo or Moose Creek activity areas. No mining of stream banks, or removal of wood or rocks extending from the stream bank, is allowed under the design features of the project. Pool quality and quantity would not be affected as natural pools may not be filled under the design features. Large, stable instream wood would not be undermined or moved during dredging activities. Large wood is generally responsible for the creation and maintenance of pool habitats. Pools with a variety of sizes of pieces provide better quality than pools without. Dredging activities would not take place in these pools. Large stable rocks provide for channel stability and smaller pocket pools. Design features prevent the movement of these rocks over 12" diameter, therefore the small pocket pool habitats would not be greatly altered by dredging activities.

Spawning gravels may be directly disturbed by dredging. The amount is likely to be low since only 12% of Lolo and less than 1% of Moose Creek were identified as suitable spawning habitat. Design features would also minimize effects. The tail ends of pools would not be mined. These are the most likely areas with suitable spawning habitat for fish. Identification of spawning areas prior to dredging activities would occur in order to avoid these areas. Dredge sites would also be located in areas of large substrate not preferred by steelhead or bull trout for spawning. These are the areas miners prefer to dredge in as more gold tends to be recovered from them. Displaced substrates would be returned to the dredge hole after activities are complete therefore disturbance would be temporary in nature (no longer than the 45 day (30 days for Lolo Creek) dredging season).

Dredging activities are expected to affect less than one mile of stream in both project areas combined. This is based on monitoring conducted in 2001. Measurements were taken of the length of stream disturbed by each operator. The Lolo Creek miners' average length of disturbance was 95 feet per operator and the Moose Creek miners averaged 72 feet. There are potentially 18 operators in Lolo Creek and 38 operators in Moose Creek. There are 14 miles of Lolo and Dutchman Creek and 19 miles of Moose, Deadwood, and Independence Creek that could be dredged. The estimated maximum potential affected area is about 0.4 miles or about 3% of Lolo Creek and 0.5 miles or 3% of Moose Creek project areas streams.

Under this alternative, 950 feet of stream banks would remain unstable at the Lolo #5 mine site.

Cumulative Effects

There would be no direct or indirect effects to bank stability or pool quality and quantity from suction dredging. With no direct or indirect effects, there can be no cumulative effects. Design features prevent miners from dredging or destabilizing stream banks and also prevent dredging around large stable pieces of wood.

There would be no cumulative effects to spawning gravel since there are no other activities in either Lolo or Moose Creek that would disturb, remove, or rearrange spawning gravels in these streams. No land management activities that directly affect stream channels have occurred on either the mainstem of Lolo or Moose Creeks; therefore they could have no cumulative effect. The only effects to spawning gravels would come from suction dredging and those effects are discussed above. They are expected to be minimal since dredging activities would avoid most spawning gravels.

The most recent Biological Opinion for suction dredging in Lolo Creek (NOAA 2009) stated that the 18 projects proposed for 2009 and 2010 suction dredging seasons would not likely jeopardize the continued existence of the Snake River steelhead. This is due to the natural redistribution of spawning gravels and re-colonization of the dredge areas between August 15 and July 15 every year. They concluded that there would be no anticipated potential for cumulative impacts from many years of small-scale suction dredge operations.

4.2.1.3 Alternative 3: Suction Dredging and Stream Improvement Project

The effects to pool quality and quantity and spawning gravel would be the same as for Alternative 2 for Lolo and Moose Creeks. The only difference is that bank stability would be improved on 0.2 miles at the Lolo #5 mining claim on Lolo Creek after recontour and planting activities were completed. This is just under 2% of the length of the mainstem of Lolo Creek in the project area. This alternative would lead to long term bank stability along this portion of Lolo Creek. Bank stability would not be affected in other areas of Lolo Creek or Moose Creek as discussed under Alternative 2.

Cumulative Effects

The cumulative effects to bank stability, pool quality and quantity, and spawning gravel would be the same as for Alternative 2.

4.2.2 Aquatic Species

4.2.2.1 Alternative 1: No Action

There would be no direct impacts to aquatic species, including ESA listed species, as a result of this alternative. Indirectly low amounts of sediment would continue to enter Lolo Creek from the Lolo #5 mine site. This could increase sediment downstream which could, in turn, affect fish through a reduction in spawning and rearing habitat quality. The effects are expected to be localized and low due to the low amount of sediment added from the site.

The area disturbed by past mining in the Lolo #5 area would not be restored under this alternative. The stream would remain channelized, banks would remain unstable, and there would continue to be increased sediment input. All of these elements result in reduced habitat quality, which could affect the use of the area by fish. The risk is low as there is adequate habitat elsewhere in the stream. In general there is more habitat available in Lolo Creek than there are fish to fill it (it is under-seeded).

Cumulative Effects

Ongoing recreational fishing for cutthroat and brook trout would continue under this alternative in Lolo Creek and for cutthroat in Moose Creek. This would not affect the long-term viability of these species since fishing pressure is very low in Lolo Creek and relatively low in Moose Creek.

4.2.2.2 Alternative 2: Proposed Action

Mortality and Injury: Potential impacts from mortality and injury to fish eggs, larvae, and alevins could stem from the following: 1) they could be crushed underfoot when operators cross streams while moving in gear and mining equipment; 2) debris tailings and fine sediment could be deposited on a redd, trapping or suffocating alevins, or 3) the eggs, larvae, or alevins could be entrained through the intake pipe. Griffith and Andrews (1981) found high mortality of entrained eggs of cutthroat trout before eye-up but mortality was less as eggs matured. Cutthroat trout sac fry suffered more than 80 percent mortality from suction dredging entrainment compared to a 9 percent natural mortality rate. Juvenile and adult salmonids would likely avoid or survive passage through a suction dredge (Harvey and Lisle 1998).

The likelihood of impacts to listed fish species is considered very low. The window for dredging operations would occur from July 1(July 15 for Lolo Creek) to August 15. This would minimize impacts to most larval and juvenile fish, and occurs after steelhead trout and bull trout emerge from the substrate. Small-scale dredging would have no effect on adult steelhead or their spawning gravels because spawning occurs 5 to 6 months later during spring flows. Effects to juvenile steelhead are expected to be very low due to very low densities. The potential effects to bull trout are considered negligible due to the absence of spawning habitat, the lack of preferred water temperatures, and the lack of bull trout within and above the mining areas in both Lolo and Moose Creeks. Effects to spring chinook in Lolo Creek would be minimized as the dredging season ends prior to the spawning season. No cutthroat were observed within the project area; therefore dredging is not expected to affect this species in Lolo Creek. There are low to moderate densities of cutthroat where dredging occurs in Moose Creek. No spawning habitat was identified therefore the risk to juveniles from dredging is low. The risk to adults is also low since they can easily move away from the dredging activity.

The small area of expected disturbance (3% of Lolo and 3% of Moose Creek), the avoidance of suction dredging in identified spawning habitat, and the use of screens on dredge pump intakes to prevent fish uptake through the pump impellers would also minimize effects to listed fish species.

Project activities have been consulted on under the ESA. The U.S. Fish and Wildlife Service concurred with the Forest Service's determination that the proposal for the 2009-2010 seasons "may affect, but is not likely to adversely affect" Lolo Creek bull trout (USFWS 2008a). They concur that the project "may affect, likely to adversely affect" bull trout and their continued existence in the Moose Creek drainage. This is due to an increase in turbidity, localized increases in sedimentation, and fish movements during project implementation. These impacts are expected to be minimal, but the effects cannot be considered negligible.

An ESA determination was also made for steelhead trout. The NOAA Fisheries was consulted and concurred that the project "may affect, likely to adversely affect" steelhead trout in Lolo Creek for the same reasons as bull trout in Moose Creek.

The project activities would not likely lead to federal listing under ESA for westslope cutthroat trout or spring chinook salmon due to project design measures. The potential effects to Pacific lamprey are also considered very low since juveniles prefer sandy habitats and miners prefer to dredge in areas with large substrate. The very low numbers of lamprey in Lolo Creek also make the risk to them negligible.

Disturbance/Displacement: Suction dredging could disturb salmon holding in deep pools during summer, particularly if numerous dredges are operating or water temperatures are elevated (Somer and Hassler 1992). Potential impacts are expected to be low since dredges are not permitted to fill natural pools. This means they cannot work within those pools. Adult spring chinook utilize deep pools in Lolo Creek that were constructed by the Forest Service in the 1980s. Snorkeling surveys of these pools in July and August show no evidence that suction dredging has occurred in them. Other species occupying dredging areas could be displaced. Given the large area available for occupation throughout Lolo and Moose Creeks, fish could easily move into other areas until dredging activities are completed. Anecdotal information from several Lolo Creek miners indicate that adult chinook have actually used the dredges for overhead cover and that young fish regularly feed below the outlet of the dredges.

Mussels: There is a low risk that mussels may be displaced by dredging activities because they prefer sandy substrates that are not preferred by miners. If displacement occurs, the mussels would be free floating until they are deposited in a location where they can re-anchor themselves. During this time, they may be more susceptible to predation by mammals. There is no survey data available to assess potential impacts to mussel populations as a result of suction dredging operations. No effects are expected to Moose Creek since no mussels are expected there.

Aquatic Insects: Aquatic invertebrates in the substrate are dislodged or otherwise disrupted by dredging operations. Displacement of these invertebrates creates a short-term attraction immediately downstream for fish who feed on them. Over the course of the operating season, dredging may locally deplete some invertebrates that are used as a food source by a variety of fish species. This would occur in the immediate vicinity of the dredged areas. Royer *et al*. (1999) evaluated the impacts of small-scale recreational suction dredging on invertebrates approximately five weeks after dredging operations. They found that aquatic invertebrate density and richness were not significantly different between the dredged areas, 35 meters downstream, and upstream reference sites. Aquatic insects in Lolo and Moose Creeks are expected to fully recover to previous levels after the mining season ends.

Sediment and Turbidity: Existing instream sediment would be displaced from the bottom of the stream and into and then out of the dredges. This would temporarily increase turbidity immediately downstream of the dredge but would not span the entire stream. Dredges usually float in the main flow of the stream (thalweg) which causes the sediment plume to also stay within that area. This could reduce the visual capability of the larger fish who typically occupy the thalweg. This could lead to reduced feeding and growth rates. This would not likely affect the smaller fish who occupy the lower velocity areas near the stream margins where turbidity levels would likely be much lower. Research has found the feeding ability and health of salmonids are not significantly impaired by the increased turbidity of suction dredging (Hassler *et* al. 1986). While significant increases in turbidity can stress juvenile salmonids, especially through gill irritation, it would not likely cause mortality (Bash *et al*. 2001). The duration of effects is also expected to be low. Past monitoring in 2001 shows that miners worked for about 5 hours a day during the mining season. Fish would be impacted only during this time frame The effects to fish species are expected to be low and very localized as the fish can move away from the turbid areas to clear water adjacent to or just downstream from the dredge. Royer *et al*. (1999) evaluated effects from both 8-inch and 10-inch commercial suction dredge operations. They found that although turbidity and total filterable solids increased downstream of the dredge, the values returned to upstream levels within 80-160 m downstream of the dredge. Turbidity values for the 8-inch dredge were approximately 25 NTUs in the immediate area of suction dredging operations, but fell to less than 5 NTUs within 40 m downstream. Furthermore, the effect of the turbidity plume was limited to approximately 7 percent of the river width. The duration of operations (20% of each day) would also minimize effects to potential feeding.

All Idaho state beneficial uses would be maintained due to the limited effects caused by suction dredging.

Cumulative Effects

The area considered for cumulative effects are the mainstems of Lolo, Dutchman, Moose, Deadwood, and Independence Creeks. These areas were selected because most fish remain relatively close to the area where they hatched, at least within their first year of life. Activities outside these areas would not directly or indirectly affect individual fish and therefore would not contribute to cumulative effects.

The time frame considered is the 45 days (30 days for Lolo Creek) during the dredging season. Activities that overlap in time and space with the season consist of the construction of the Independence Creek ford (water crossing) on Moose Creek. This activity could injure or displace fish or aquatic insects and increase turbidity that could affect aquatic species. Road decommissioning was not considered as none is proposed within the cumulative effects area. The use of roads was also not considered since stream flows are low and rains are infrequent during the dredging season. Without rain to create surface runoff, roads would not contribute sediment to streams.

There would be minimal cumulative effects to aquatic species from injury, displacement and turbidity on Lolo and Moose Creeks. Dredging is expected to affect a maximum of 3% of Lolo and Moose Creeks for about 5 hours, or 20%, of each day. Dredging also implements design features to minimize effects to fish species. For Moose Creek, the construction of the Independence Ford may kill individual fish but the likelihood is low. Fish typically avoid disturbance activities such as vehicles moving around the stream. The construction would also increase turbidity over the estimated 2 week time frame it should take to complete the project. Turbidity would be increased while construction occurs within the stream channel (roughly 8 hours per day). This would temporarily displace fish. The cumulative effects to species are expected to be low due to design features and the short duration of the activities. No cumulative effects to ESA listed bull trout are expected since no bull trout have been found in Independence Creek and very low densities occur downstream.

4.2.2.3 Alternative 3: Suction Dredging and Stream Improvement Project

The effects to aquatic species from dredging operations would be the same as those discussed for Alternative 2.

The improvement activities associated with the Lolo #5 mine site could potentially result in direct mortality of fish and aquatic insects while machinery crosses Lolo Creek to access the site. The machinery may also cause direct mortality if it works in the stream channel during the recontouring of the streambank. The likelihood of direct mortality to fish is low in both cases as fish typically would move away from large moving objects. Temporary displacement of fish in the area would occur only while the machinery is working. Fish would be expected to repopulate the area after project completion. Streambank recontouring activities would temporarily increase sediment and turbidity levels downstream. As with suction dredging operations, the effects to fish would be minimal as they can easily move away from turbid areas. Direct mortality of aquatic insects would occur where the machine crosses the stream and works to recontour the streambank. The overall effect to insect populations is minimal given the small area of disturbance. Improvement work outside of the stream channel would have no effects to aquatic species. There would be long term benefits to all aquatic species through improved habitat.

The determinations for ESA listed species are the same as for Alternative 2.

Cumulative Effects

The cumulative effects to aquatic from this alternative in Lolo Creek would not be any different than those from Alternative 2. Disturbance to aquatic species would increase slightly, however, most reclamation activities would occur outside the stream channel and would not effect them.

4.3 Potential Effects on Riparian Wildlife

4.3.1 Alternative 1: No Action

There would be no project related direct or indirect effects to wildlife or their habitat since no activities would occur. Wildlife would continue to tend to avoid occupied campsites due to the presence of humans. With no direct or indirect effects, there would be no cumulative effects to riparian wildlife species.

4.3.2 Alternative 2: Proposed Action

There would be no reduction in habitat for terrestrial threatened, management indicator or sensitive species since no vegetation would be removed under this alternative. Miners would camp at existing sites and would use existing roads and paths to move their equipment to and from the stream.

The potential impacts to deer, moose, elk, marten, goshawk, fisher, and gray wolf would be from the presence of humans in both Lolo and Moose Creek areas. The effects are expected to be minimal with species typically avoiding areas where people camp, recreate, or dredge. There is sufficient habitat surrounding all the mining claims to support the species during mining operations. There would be no effect to lynx at the Moose Creek sites other than the avoidance of humans since no denning habitat occurs in the area.

Riparian wildlife species that could be directly affected by activities associated with suction dredging would include belted kingfisher, boreal toad, and the giant salamander. Foraging kingfishers could be disturbed by dredging operations. Nesting would not be affected since brood rearing is complete by the time the dredging season begins. Suction dredging would have no effect on local populations since kingfishers are likely to return to the area once the dredges are shut down for the day. Boreal toads and adult giant salamanders however could be inadvertently killed by miners moving equipment through the riparian area. Juvenile salamanders in the stream may be killed or injured by dredging activities. The likelihood is low due to expected low numbers of sightings in both Lolo and Moose Creeks. There would be no effect to eggs of either species since they are laid in standing or quite backwaters. Dredging does not occur in these areas. In addition, the eggs would already be hatched prior the beginning of the dredging season.

Cumulative Effects

The area considered for riparian wildlife cumulative effects is all areas within one-quarter mile of the dredging activities in the streams. This area was chosen as most human activities such as dredging, camping and fishing would occur in this area. Wildlife and humans could not be visible to one another because of trees, shrubs and other vegetation, minimizing disturbance. The risk of wildlife being inadvertently killed outside this area is non-existent.

The time frame considered is 45 days (30 days for Lolo Creek) because that is the timeframe for the suction dredging season. There are no other proposed activities that overlap in time and space with the mining season and the cumulative effects area. Camping, fishing and vehicle use on streamside roads near the claims are included in the existing condition. Therefore, although these activities could disturb wildlife and cause them to move away from suitable riparian habitat or be inadvertently killed, are not considered as cumulative effects.

Direct effects are minimal and of short duration. There would be no indirect effects. Within minimal direct and no indirect effects, cumulative effects would not occur. There are no other activities within the project areas that contribute to cumulative effects.

4.3.3 Alternative 3: Suction Dredging and Stream Improvement Project

The direct, indirect, and cumulative effects on wildlife from would be the same as under Alternative 2. There would be no difference in effects to wildlife species with the addition of the Lolo #5 mine reclamation site.

4.4 Potential Effects on Sensitive Riparian Plants

4.4.1 Alternative 1: No Action

There would be continued direct localized and minor impacts on sensitive riparian plants from streamside campers, berry-pickers, and others. There would be no cumulative effects since they can only arise from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. There are no actions associated with this alternative.

4.4.2 Alternative 2: Proposed Action

Foot traffic from miners in riparian areas may trample individual sensitive plants as they move their equipment to and from the stream channel. The risk is low since the area potentially disturbed would likely be limited to a few trails along the creek and to existing camping sites. Since miners only move their dredges in and out of the stream once during the season, the majority of effects would be related to foot traffic and not to the movement of equipment. Most of the sensitive riparian plant species do not occur on already disturbed sites. The risk is also expected to be low due to the limited numbers of sightings in the study areas.

Cumulative Effects

The area considered for all aquatic cumulative effects analyses are the streamside areas where dredgers camp and access their claims with their equipment. Other forest visitors also use these areas for camping and fishing. These areas are the most likely to contain riparian dependent sensitive plants that could be disturbed by their activities.

The time frame considered is (30 days for Lolo Creek) days because that is the timeframe for the suction dredging season. Cattle grazing is the only other proposed activity that overlaps in time and space with the mining season and the cumulative effects area. Grazing occurs along a portion of Lolo Creek where stream exclosures are not in place. This could result in trampling or disturbance of sensitive plant species. Camping and fishing are included in the existing condition. Therefore, although these activities could trample riparian species, they are not considered as cumulative effects.

Cattle grazing occurs along portions of Lolo Creek as part of the Eldorado Allotment. Cattle have access to about 7 miles of Lolo Creek where there are no exclosure fences in place. Cattle can only access a portion of this area and are restricted to the lower gradient sections by steep slopes and thick vegetation. It is in these areas that cattle have to potential to trample sensitive riparian plant species. Exclosures fences occur on about 1 mile of Lolo Creek in order to protect important fish spawning habitat. These also protect sensitive riparian plants from trampling.

The risk of direct and indirect effects from project activities to sensitive plant species is expected to be low. The potential for cumulative effects is increased slightly due to grazing in Lolo Creek. Grazing tramples vegetation but rarely creates permanent trails or large bare disturbed areas, which leaves most plants alive. Cumulatively, grazing in combination with the proposed activities would not lead toward the listing of any of the sensitive plant species under the ESA.

4.4.3 Alternative 3: Suction Dredging and Stream Improvement Project

Potential direct, indirect, and cumulative impacts on sensitive riparian plants would be the same as under Alternative 2. There would be no difference in effects to sensitive plant species with the addition of the Lolo #5 mine reclamation site. It is unlikely that any sensitive plants occur in the highly disturbed reclamation area.

4.5 Potential Effects on Recreation in Lolo and Moose Creeks

4.5.1 Alternative 1: No Action

Under the No Action Alternative, the Forest Service would not approve proposed plans of operations. Recreational suction dredging would not occur in the areas. This decrease would likely be offset by other

recreationers using the same campsites. There would be no change in the Recreation Opportunity Spectrum (ROS) under this alternative.

There would be no direct or indirect effects, and therefore no cumulative effects to recreation as a result of this alternative since no dredging activities would occur.

4.5.2 Alternative 2: Proposed Action

There would be minimal impacts to total recreation visitation and no change in the ROS in either watershed under this alternative. Miners are not permitted to camp in developed campsites.

Dredge pumps and/or compressors would generate noise, as would the generators and recreational vehicles, atvs and motorcycles of non-miner campers. Non-miners generally avoid the camping areas used by miners, preferring other areas for camping for the 45 days (30 days for Lolo Creek) that mining is allowed. Monitoring has shown that dredging activities occur for an average of 5 hours per day, or roughly half a normal day. Because of the limited number of suction dredge operations, there would be no change in campsite concentration in the project areas, and thus no overall change in the number of recreational visitors.

Fishing is expected to be very low in the area due to fish numbers. No cutthroat trout were observed, and brook trout occur in very low numbers in Lolo Creek which limits fishing opportunities. Populations are higher in Moose Creek but fishing is only low to moderate and occurs mostly in the lower reaches below Osier Creek. Since suction dredge areas comprise a very limited portion of these watersheds (3% of both Lolo and Moose Creeks), and operate for only 4 to 5 hours per day over a 45 day (30 days for Lolo Creek) season, impacts to fishing opportunity would be minimal. Fishermen also prefer to fish near dawn and dusk and miners generally operate from mid-morning to early afternoon. This would reduce potential conflicts between fishermen and miners.

During the annual 45-day (30 days for Lolo Creek) mining period, visitors to the historic trails in Lolo Creek area could be annoyed by noise generated by dredging equipment, camping generators, and recreational vehicles. The annoyance would be temporary as the trails parallel the creek for less than 1 mile on the northern end of the project area near Yoosa Creek (the Northwest Lolo Placer claim). Noise levels are expected to be low due to the thick vegetation.

Cumulative Effects

The area considered for recreation cumulative effects is all areas within one-quarter mile of the dredging activities. This area was chosen as noise levels are not likely to travel much farther than due to topography and vegetation that break up sound. Also, most recreational fishing and camping occurs within this area.

The time frame considered is 45 days (30 days for Lolo Creek), because that is the timeframe for the suction dredging season. Cattle grazing is the only other proposed activity that overlaps in time and space with the mining season and the cumulative effects area. Grazing occurs along a portion of Lolo Creek where stream exclosures are not in place. The presence of cattle could deter from the recreational experience. Dispersed camping occurs along both Lolo and Moose Creeks. Campers include the suction dredgers and other recreators. Use is low to moderate and is based on the number of camping areas available. Fishing occurs throughout the summer but does not occur in large numbers in either Lolo or Moose Creeks. There are only about 13 miles of road near Lolo Creek (primarily Forest Road 100) and 10 miles near Moose Creek (Forest Roads 255 and 5440) available for public use. Use is moderate during the dredging season as Road 100 and 255 are primary access routes through the forest. There is a low potential for use of Forest Road 100 for logging traffic related to the Swede Fuels and Johnson Thin Projects which could temporarily increase traffic levels. The risk is low as they may haul through Weippe instead of hauling down Road 100 to Kamiah.

The direct effects from miners and cattle grazing on other recreational opportunities are minimal and of short duration. There would be no indirect effects. Within minimal direct and no indirect effects, cumulative effects would not occur. There would be minimal impacts to total recreation visitation and no change in the ROS in either watershed under this alternative.

4.5.3 Alternative 3: Suction Dredging and Stream Improvement Project

The potential effects of suction dredging under this alternative would be the same as under Alternative 2. In addition, there would be some minor effects on recreational use from implementation of the Lolo #5 reclamation project under this alternative. Stream restoration would require the use of heavy equipment, creating noise and visual disturbance for the duration of the project. Project activities would occur for probably one month which would overlap with the mining season.

This would have a minor effect on other recreational visitors, because of the abundant availability of other recreational opportunities. There would be minimal impacts to total recreation visitation and no change in the ROS in either watershed under this alternative.

Cumulative Effects

Potential direct, indirect, and cumulative impacts on recreation would be the same as under Alternative 2. There would be no difference in effects to recreation with the addition of the Lolo #5 mine reclamation site.

4.6 Potential Effects on Nez Perce Treaty Rights and Traditional Uses

4.6.1 Alternative 1: No Action

Under the no action alternative, there would be no direct, indirect, or cumulative effects on the opportunities for Tribal members to fish in usual or accustomed places. There would be no impacts to tribal treaty rights or traditional uses relating to fish. Tribal fishing would continue as it presently does. The Nez Perce Tribe would continue to operate the hatchery on Yoosa Creek which occurs just upstream from the project area. Continuing activities under this alternative are likely to have no effect on hatchery operations including the capturing of adult chinook salmon for egg-taking purposes at the tribal weir site within the project area. Tribal hunting and gathering on Forest land would continue as it presently does.

4.6.2 Alternative 2: Proposed Action

Under this alternative, there could be impacts to tribal fishing in 3% of the total area of mainstem Lolo Creek where suction dredge activities are proposed. During the mining season, dredging operations may interfere with tribal fishing activities. Dredging noise, activities in and near the streams may scare away salmon, however anecdotal information suggests that adult salmon often use the dredges for cover and juvenile fish are often seen feeding in the plume created by the dredge. The presence of miners and other recreators may impact the experience associated with traditional tribal fishing and gathering practices.

Suction dredging operations would minimally affect water quality and aquatic species in Lolo and Moose Creeks as there would be minor increases in turbidity. There would be no increase in sediment from terrestrial sources. Suction dredge operations may affect individual fish (either adult or juvenile), but would not affect the survival of any species. Under the operating conditions, design features and mitigation measures described in Chapter 2, dredge sites must be located in areas of large substrate not preferred for spawning steelhead trout and bull trout, and operators are required to conduct all dredge mining 50 feet or more from identified spawning areas.

There would be no effects to tribal hatchery operations in Yoosa Creek, upstream of the Lolo Creek project area. Minimal alteration would occur to juvenile rearing habitat. Juvenile releases from the tribal Yoosa hatchery occur in the fall, after the end of the dredging season. Suction dredge operations would not interfere with tribal capture of adult chinook at the weir site on Lolo Creek as mining would not occur at the site.

Game animals may avoid stream corridors where suction dredge mines are operating due to human activity and noise. The effects are expected to be minimal with species typically avoiding areas where people camp, recreate, or dredge. There is sufficient habitat surrounding all the mining claims to support game species during mining operations. There would be no effect to tribal hunting opportunities.

There would be no impacts to tribal gathering from suction dredging under this alternative. Camas, whitebark pine seeds, berries, and other commonly gathered foods are not found in the stream channel, and would not be directly affected. There would be minimal impacts to riparian vegetation as previously discussed. There could be indirect impacts to traditional resources as the exact location of traditional resources is considered confidential and is not provided to members of the public. The CNF has maintained contact with the Nez Perce Tribe to identify potential impacts to tribal gathering resources in the Lolo Creek area.

This project would not affect the opportunity for Tribal members to pasture stock on open and unclaimed land. There would be no effect from this proposal on meadow environments or areas normally used for pasture.

Cumulative Effects

The area considered for cumulative effects are the entire Lolo and Moose Creek project areas as these areas lie within Tribal ceded lands.

The time frame for cumulative effects is the annual 45 day (30 days for Lolo Creek) mining operating season. The activities that overlap in time and space that could affect tribal fishing, hunting, and gathering is cattle grazing. Recreational camping and fishing are considered part of the existing condition and are not considered for cumulative effects. There would be minimal cumulative effects to aquatic species from injury, displacement, and turbidity on Lolo and Moose Creeks. Dredging is expected to cumulatively affect a maximum of 3% of each stream for about 5 hours, or 20%, of each day. Fishing is expected to be very low in the area due to the presence of, and noise created by the dredges. Fishing pressure is low; therefore, the cumulative effects of fishing when combined with dredging and cattle grazing would be low. The project has been designed to have minimal effects to aquatic species, particularly listed steelhead and bull trout. The direct effects are minimal and of short duration. There would be no indirect effects. With minimal direct and no indirect effects, cumulative effects would not occur.

4.6.3 Alternative 3: Suction Dredging and Stream Improvement Project

Potential effects to tribal fishing access, hunting and gathering from suction dredging under this alternative would be the same as those identified for Alternative 2. Reclamation of the Lolo #5 mine site would improve fish habitat in the long term in this reach of Lolo Creek, resulting in a beneficial effect on tribal fishing. Noise and activity during the operation of heavy equipment used to complete the reclamation work could cause game animals to avoid the area. This impact would be temporary, ending when construction was complete. The restoration project would actually disturb stream bank vegetation; however, it would not affect tribal gathering activities since the stream bank is mostly unvegetated and unstable. Restoration activities would affect 950’ of stream for about one month.

Cumulative Effects

Potential cumulative impacts on tribal fishing, hunting, and gathering would be the same as under Alternative 2. There would be no difference with the addition of the Lolo #5 mine reclamation site.

4.7 Potential Effects on the Moose Mountain Roadless Area

4.7.1 Alternative 1

There would be no suction dredging activities in the study area under this alternative. Current activities would continue, including vehicle use on Forest roads, camping, hunting, fishing and hiking. Therefore, there would be no direct, indirect or cumulative effects to Moose Mountain Roadless Area.

4.7.2 Alternatives 2 and 3

There are 19 mining claims with the Moose Mountain Roadless Area. Direct, indirect and cumulative effects are considered below. The area considered for cumulative effects is the Moose Mountain Roadless area. The time frame is the 45 day suction dredging season. Camping, fishing, hunting and hiking are part of the existing condition and are not considered for cumulative effects. There are no other proposed activities

that overlap in time and space with the mining season and the cumulative effects area. The direct, indirect and cumulative effects caused by suction dredging to roadless characteristics within the Moose Mountain Roadless Area are as follows:

1) **High quality or undisturbed soil, water, and air:**

   Soil: The direct impact to soils would be from miners camping and using trails to access streams. They would use existing dispersed camping areas and trails. The effects are expected to be minor as a result. The direct effects to soils would be minimal and there would be no indirect effects; therefore there would be no cumulative effects to undisturbed soils.

   Water: There would be minor effects to turbidity caused by suction dredging. It would be short in duration, averaging 5 hours per day for the 45 day dredging season. There would be no effects to stream temperatures. The direct effects would be minimal and short duration.

   There are no other activities considered for cumulative effects because there are no other management activities that would increase sediment or temperature in the roadless area.

   Air: Suction dredges are powered by a gasoline engine. They are operated for an average of 5 hours per day. There are no other activities considered for cumulative impacts. The direct and indirect effects of pollutants being emitted from the small engines (15 hp or less) would be negligible. They are so minor that the do not require permits or approvals. With no direct or indirect effects, there would be no cumulative effects.

2) **Sources of public drinking water:**

   There are no municipal watersheds or other public drinking water sources identified within the Moose Mountain Roadless Area. There would be no direct, indirect, or cumulative effects to this resource.

3) **Diversity of plant and animal communities:**

   Plant communities: No threatened or endangered plant species are known to occur within the Moose Mountain Roadless Area (USFS 2008 c). Sensitive plants are likely to occur. The only ones that could potentially be affected are those within riparian habitats where miners access the streams (see Sensitive Plant section above). There would be no tree cutting or removal of any plants. Foot traffic from miners in riparian areas may trample individual sensitive plants as they move their equipment to and from the stream channel. The risk is low since the area potentially disturbed would likely be limited to a few trails along the creek and to existing camping sites. Since miners only move their dredges in and out of the stream once during the season, the majority of effects would be related to foot traffic and not equipment removal. Most of the sensitive riparian plant species do not occur on already disturbed sites. The risk is also expected to be low due to the limited numbers of sightings in the study area.

   There are no other management activities considered for cumulative effects. Direct effects are minimal and of short duration. There would be no indirect effects. Within minimal direct and no indirect effects, cumulative effects would not occur. There are no other activities within the project areas that contribute to cumulative effects.

   Animal communities: Wildlife would continue to tend to avoid suction dredge sites due to noise and the presence of humans. Some animals may suffer short term displacement in the vicinity of the dredging, but the displacement is expected to be localized and temporary. There would be minimal effects to animals that use riparian areas (see Wildlife Section above). There are no other management activities considered for cumulative effects. Direct effects are minimal and of short duration. There would be no indirect effects. Within minimal direct and no indirect effects, cumulative effects would not occur. There are no other activities within the project areas that contribute to cumulative effects.

4) **Habitat for threatened, endangered, proposed, candidate, and sensitive species, and for those species dependent on large, undisturbed areas of land:**

Because suction dredging is confined to the wetted perimeter of the stream, impacts to threatened, endangered, or sensitive wildlife would be negligible. Under the action alternative, for 10-1/2 months of the year, the temporary noise and other human impacts associated with small-scale dredging would not be present. Most sensitive wildlife species would not be affected. Suction dredging may affect individuals or habitats of those sensitive wildlife species that occur in the vicinity of the dredge site through displacement, but it would not likely cause a trend toward federal listing or reduced viability for populations of these species. No ESA listed wildlife or plants would be affected.

Design features would minimize direct and indirect impacts to habitat for threatened and sensitive fish. Due to the limited number of dredging operations, the small areas being disturbed, and the low numbers of bull trout suspected in the dredge sites, there is a low risk of direct impacts on juvenile bull trout. Bull trout observations have been very limited. Potential effects of entrainment of juvenile bull trout via suction dredging are considered insignificant and discountable (USFS 2008 b). There would be similar effects to cutthroat trout, a sensitive species.

The direct and indirect effects to threatened and sensitive fish species are considered minor. There would be no cumulative effects since no other foreseeable management activities are planned within the roadless area.

5) Primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation:

The direct effect of the presence of an operating suction dredging to the dispersed recreational experience would be its visual presence and its noise. Hikers on Trail 690 may see the dredges in Moose Creek, but visual contact and noise would be limited by dense vegetation and topography. A suction dredge operator typically works the dredge for 5 hours per day and the season lasts for 45 days. The limited number of days and hours of operation would minimize the effects. There would be no effect to the ROS.

The direct effects are minimal and of short duration. There would be no indirect effects. With minimal direct and no indirect effects, cumulative effects would not occur. There are no other activities within the roadless areas that contribute to cumulative effects.

6) Reference landscapes:

Small-scale suction dredging would not visually effect or change the Moose Mountain Roadless Area. Suction dredging is confined to the wetted perimeter. The dredge operator is required to reclaim the suction dredge site. It is difficult to impossible to identify reclaimed dredge sites after seasonal high flows. There would be no direct, indirect, or cumulative effects to the reference landscape.

7) Natural appearing landscapes with high scenic quality:

There would be no direct, indirect, or cumulative effects to natural appearing landscapes with high scenic quality, because management actions would be confined to the wetted perimeter of the steam and is obscured by dense vegetation. There are no other planned management activities within the roadless areas that would contribute to cumulative effects.

8) Traditional cultural properties and sacred sites:

There would be no direct, indirect or cumulative effects to traditional cultural properties and sacred sites (Vallier, 2004). Individuals who encounter artifacts or other cultural resources on the National Forest are required by the permit to leave the object(s) in place and contact the local District Ranger who would contact the archaeologist.

9) Other locally identified unique characteristics:

No locally unique characteristics have been identified within the Moose Mountain Roadless area; therefore, there would be no direct, indirect, or cumulative effects.

4.8 Irreversible and Irretrievable Commitment of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

The removal of gold in all action alternatives is an irreversible commitment of resources. Due to limited operating seasons, design features and mitigation measures, size and type of suction dredges, the amounts of gold recovered by suction dredge operations is expected to be relatively minor. Occasional fish may be killed by suction dredges; however, the Forest Service in consultation with regulatory agencies has determined that this mortality would not jeopardize the survival of any threatened or endangered species.

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GLOSSARY

affected environment - The biological and physical environment that would or may be changed by actions proposed and the relationship of people to that environment.

alternative - One of several policies, plans, or projects proposed for decisionmaking.

anadromous fish – Fish which spend much of their adult life in the ocean, returning to inland waters to spawn; eg., salmon, steelhead.

aquatic ecosystem – a stream channel, lake, or estuary bed, the water itself, and the biotic communities that occur therein.

biological assessment - An assessment done to determine whether a given alternative (usually on the preferred) would affect threatened, endangered or 'proposed' animal or plant species.

biological evaluation - An assessment done to determine whether a given alternative (usually on the preferred) would affect sensitive animal or plant species.

camas - plant with showy cluster of blue or white flowers and edible bulb traditionally harvested by Nez Perce Tribal members.

channel type - A system developed by hydrologist Dave Rosgen To classify and characterize similar stream channels. Water surface gradient and substrate particle size are the primary stream features used. Other features include bankfull width, width to depth ratio, entrenchment ratio, and floodprone width.

course woody material – Trees and tree parts including root wads within the ordinary high water line that are large enough to function in the channel forming processes of a stream.

Council on Environmental Quality (CEQ) - an advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

critical habitat - Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species.

cultural resources - The physical remains of human activities, such as artifacts, ruins, burial mounds, petroglyphs, etc., and the conceptual content or context, such as a setting for legendary, historic, or prehistoric events as a sacred area of native peoples, etc., of an area.

cumulative effect - The impact which results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

direct effects - effects on the environment that occur at the same time and place as the initial cause or action.

dispersed recreation – that type of recreation that requires few if any improvements and may occur over a wide area. Examples of such activities include hunting, fishing, berrypicking, off-road vehicle use, hiking, horseback riding, picnicking, camping, viewing scenery, and snowmobiling.

effects (or impacts) - Physical, biological, social, and economic results (expected or experienced) resulting from natural events or management activities. Effects can be direct, indirect, and/or cumulative.

embeddedness – Degree that gravel and larger sizes if particles are surrounded or covered by fine sediment (e.g., less than 2mm) (Armantrout 1998).

endangered species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register. (Endangered Species Act of 1973).

entrainment – accumulation or drawing in of substrate material and aquatic organisms by current, such as at a nozzle intake.

environmental baseline conditions – The existing condition for all environmental factors affecting fish and fish habitat in relation to their natural condition. The Matrix of Pathways and Indicators can be used to describe environmental baseline conditions at the watershed or sub-watershed scale.

Essential habitat - Areas with essentially the same characteristics as critical habitat but not declared as such. These habitats are necessary to meet recovery objectives for endangered, threatened, and proposed species.

fine sediment – Fine-grained particles (2mm or less in diameter) in stream banks andsubstrate.

floodplain - Low land and relatively flat areas joining streams, rivers, and lakes which are periodically inundated by overbank flows of water.

Forest Plan - Clearwater National Forest Land and Resource Management Plan, September 1987.

habitat - Areas or features of the forest that are important for maintaining healthy, productive wildlife, fish or plant populations. Special features may include riparian areas; old forest conditions; hiding or security cover; critical breeding and rearing areas; and/or space to establish territories or home ranges.

high banking – mining for minerals outside the wetted width of a stream from which water is removed and used to separate gold and other minerals with the aid of a sluice box and hopper. Water is supplied by hand or pumping. Material to be mined is supplied to the processing site by means other than suction dredging.

IDT, ID Team – interdisciplinary team. A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view to bear on the problem.

Indicator Species – Species of fish, wildlife, or plants which reflect ecological changes caused by land management activities.

indirect effects - Secondary effects which occur in locations other than the initial action or significantly later in time.

invasive aquatic species - all aquatic invasive species pose a threat to waterways, fisheries and recreation in Idaho. Common invasive aquatic species include: Brazilian Elodea, Parrotfeather Milfoil, Water Hyacinth, Erasian water milfoil, Hydrilla, Zebra/Quagga Mussel, New Zealand Mudsnails, and Feathered Mosquito Fern.

impact - A spatial or temporal change in the environment caused by human activity.

issue - a subject or question of widespread public discussion or interest regarding management of National Forest System lands.

large woody debris – Pieces of trees that meet a size criterion based on the region and stream size in which they are located. For example, within a region, size criterion for wood located in medium to large stream is greater than for small streams. Refer to the Matrix of Pathways and Indicators for specific size criterion (National Marine Fisheries Service 2009).

macro invertebrate – An invertebrate (without backbone) animal that large enough to be seen without magnification.

Management Indicator Species - A species selected because its welfare is presumed to be an indicator of the welfare of other species sharing similar habitat requirements. A species of fish, wildlife, or plant, which reflect ecological changes caused by land management activities.

mining claim - A geographic area of the public lands held under the general mining laws in which the right of exclusive possession is vested in the locator of a valuable mineral deposit. Includes lode claims, placer claims, mill sites and tunnel sites.

mitigation - avoiding or minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact by preservation and maintenance operations during the life of the action.

noxious weed - plants that have been designated by federal, state, or county officials and defined as, "A plant that interferes with management objectives for a given area of land at a given point in time." The Idaho Noxious Weed Law defines a "noxious weed" as any exotic plant species that is established or that may be introduced in the State, which may render land unsuitable for agriculture, forestry, livestock, wildlife, or other beneficial, uses and is further designated as either a State-wide or County-wide noxious weed (Idaho Code 24 chapter 22). Primary concerns are generally expressed as losses in commodity yield or interferences of land use. However, impacts of these invasive, non-native plants to ecosystem function and health are becoming increasingly important.

mineral withdrawal - an action taken by Congress or the Secretary of the Interior that withdraws, or closes, a specified area from activities under the mining law. In it's most common application, new mining claims are prohibited and proposed operations on existing claims are allowed to proceed only after a valid existing rights determination has been made.

PACFISH - The Decision Notice/Decision Record, Finding of No Significant Impact, and Environmental Assessment for the interim strategies for managing anadromous fish producing watersheds in eastern Oregon and Washington, Idaho, and portions of California. Published by the USDA Forest Service and USDI Bureau of Land Management in 1995.

preferred alternative - the agencies preferred alternative, one or more, that is identified in the impact statement.

peak flow– Highest discharge recorded within a specified period of time that is often related to spring snowmelt, summer, fall, or winter flows successional patterns, and species composition.

pool – a depression in the stream channel with a gradient less than 1% that is normally wider and deeper than the channel above or below.

proposed threatened or endangered species - Plant or animal species proposed by the U.S. Fish & Wildlife Service or National Marine Fisheries Service to be biologically appropriate for listing as threatened or endangered, and published in the Federal Register. It is not a final designation.

Ranger District - Administrative subdivision of the Forest supervised by a District Ranger.

reach –Any specified length of stream.

rearing habitat – Areas where larval and juvenile fish find food and shelter to live and grow.

Record of Decision (ROD) - A document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision about an alternative assessed in the environmental impact statement chosen for implementation.

redd – Nest excavated in the substrate by fish for spawning where fertilized eggs are deposited and develop until the eggs hatch and larvae emerge from the substrate.

reference landscape – landscapes, generally roadless areas, with minimal human disturbance that are used as a barometer for measuring the effects of development on other parts of the landscape.

refugia – Habitat that sustains fish and other organisms during periods when ecological conditions are not suitable elsewhere.

resident fish – Fish species that remain in one stream or river system.

revegetation – the reestablishment and development of plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of man; e.g., reforestation, range reseeding.

RHCA – Riparian Habitat Conservation Area – are areas delineated in every watershed within the Clearwater National Forest. RHCAs are portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines.

Roadless Area - An area of National Forest which (1) is larger than 5,000 acres or, if smaller, is contiguous to a designated wilderness area or primitive area, 92) contains no roads, and (3) has been inventoried by the Forest Service for possible inclusion into the wilderness preservation system.

scoping - The procedures by which the Forest Service determines the extent of analysis necessary for a proposed action; i.e., the range of actions, alternatives and impacts to be addressed, identification of significant issues related to a proposed action, and establishing the depth of environmental analysis, data, and task assignments needed.

Sensitive Species - Those species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in population numbers or density, or habitat capability that would reduce a species' existing distribution.

sediment – Fragmented from weathered rocks and organic material that is suspended in, transported by, and eventually deposited by water or air.

soil displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

stream bank stability – Index of firmness or resistance to disintegration of a bank based on the percentage of the bank showing active erosion and the presence of protective vegetation, woody material, or rock.

substrate – Mineral and organic material forming the bottom of rivers and streams.

threatened species - Any species defined through the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range and published in the Federal Register.

turbidity – Measure of the extent to which light penetration in water is reduced from suspended materials such as clay, mud, organic material, color, or plankton. Measured by several nonequivalent systems including nephelometric turbidity units (NTU).

viable population - A wildlife or plant population that contains an adequate number of reproductive individuals to appropriately ensure the long-term existence of the species.

WATBAL – a computer model that analyzes and predicts effects of activities on water quality and quantity.

wetted perimeter – The areas of a watercourse covered with water, flowing or nonflowing.

width:depth ratio – An index of the cross section shape of a stream channel at bankfull level.

Appendix A

Past, Present and Foreseeable Actions

Lolo Drainage

Past Timber Harvesting Above Musselshell in the Lolo Drainage

TRS	Timber Sale	Drainage	Estimated Treatment Acres	Year Completed
T34N, R6E, Sec 4, 33	April Cr. #2	April	18	1973
T34N, R6E, Sec 5, 6, 7, 8	Lowboy	Brady Nevada	199	1989
T35N, R6E, Sec 2, 3 T36N, R6E, Sec 25, 26, 34, 35, 36	Dutchman salvage	Dutchman	52	2002
T35N, R6E, Sec 2, 3, 10 T36N, R6E, Sec 26, 34, 35, 36	Dutchman	Dutchman	841	1986-1987
T35N, R6E, Sec 2, 3, 4, 26, 34, 35, 36	Pioneer Mine	Dutchman	1030	1977-1981
T35N, R6E, Sec 3	Gold Cr #2	Dutchman	180	1981
T35N, R6E, Sec 3, 4	Pioneer Gold Salvage	Dutchman	20	1981
T35N, R6E, Sec 3, 4 T36N, R6E, Sec 26, 34, 35	New Pioneer OSR	Dutchman	582	1994
T36N, R6E, Sec 26, 34	Johnson Gold	Dutchman	34	2002
T36N, R6E, Sec 26, 35, 36	Flying Dutchman Salvage	Dutchman	21	1998
T36N, R6E, Sec 34	Last Chance	Dutchman	138	1986
T36N, R6E, Sec 35	Old Pioneer	Dutchman	33	1982
T35N, R7E, Sec 3, 4	Knoll Cr Bugs	Knoll	81	2003
T34N, R6E, Sec 5, 6	Section 6 WP	Lolo	40	1981
T34N, R6E, Sec 5, 8, 9	Brady Cr. OSR	Lolo	108	1974-1977
T35N, R6E, Sec 1, 2 T36N, R6E, Sec 36	Upper Lolo OSR	Lolo	197	1983-1986

T35N, R6E, Sec 10, 15	Lucky 10 Pulp	Lolo	138	1991
T35N, R6E, Sec 17, 20, 21, 22, 28, 29	Lolo Forks	Lolo	2526	1977-1992
T35N, R6E, Sec 17,20	Big Slide	Lolo	33	1974-1976
T35N, R6E, Sec 20, 21, 28, 29	Big Fill CP SSTS	Lolo	16	1981
T35N, R6E, Sec 20, 21, 28, 29	Zahn's Houselog	Lolo	16	1981
T36N, R7E, Sec 30	Upper Lolo #1	Lolo	12	1975
T35N, R6E, Sec 15, 16, 17, 28, 29, 33	Burnt Salvage	Lolo, Utah, Nevada, Mike White, White	194	1985
T35N, R6E, Sec 1, 2, 11, 12, T36N, R6E, Sec 25, 35, 36 T36N, R7E, Sec 30, 31	Relaskop Salvage	Lolo Yoosa	1256	1999
T35N, R6E, Sec 10, 15, 22	Lolo Chamook	Lolo Yoosa	119	1994
T35N, R7E, Sec 4, 5, 6 T36N, R7E, Sec 29, 31, 32, 33, 34	Lolo Yoosa	Lolo Yoosa	320	1993-1995
T35N, R6E, Sec 28, 29, 33, 34	Mike White	Mike White	737	1984-1985
T35N, R6E, Sec 28, 29	5028 Salvage	Mike White White	28	2002
T35N, R6E, Sec 4,5	Nevada Cr. WP	Nevada	60	1972
T35N, R6E, Sec 2, 3,9,10, 11, 16, 17, 20	Siberia #2	Siberia	404	1991-1992
T36N, R6E, Sec 34, 35	Little Red Salvage	Siberia	47	1987
T34N, R6E, Sec 4, 5 T35N, R6E, Sec 28, 32, 33, 34	Deer Utah	Utah	401	1991-1995
T35N, R6E, Sec 5, 29-33	Utah Creek	Utah	1248	1959-1966
T35N, R6E, Sec 21	White Cr. #2	White	1030	1983-1984
T35N, R6E, Sec 21, 28, 29, 32, 33, 34	White Salvage	White	436	1998

T35N, R6E, Sec 1	Chamook CP	Yoosa	24	1970
T35N, R6E, Sec 1 T35N, R7E, Sec 6 T36N, R7E, Sec 31	Dead End Poles	Yoosa	148	1983-1985
T35N, R6E, Sec 1, 10, 11, 12, 15 T35N, R7E, Sec 6 T36N, R6E, Sec 36	Chamook Cr	Yoosa	393	1960
T35N, R6E, Sec 1, 12 T35N, R7E, Sec 6, 7	Relaskop Cr	Yoosa	509	1978-1981
T35N, R6E, Sec 1, 12 T35N, R7E, Sec 7	Releskop Pulp	Yoosa	210	1984
T35N, R6E, Sec 1, 2 T36N, R6E, Sec 35 T36N, R6E, Sec 36	Deadwood	Yoosa	132	1983
T35N, R6E, Sec 1, 2, 10, 11, 12 T35N, R7E, Sec 6	Camp Cr. WP	Yoosa	112	1978-1979
T35N, R6E, Sec 1, 5, 6, 8	Bess Middle Yoosa	Yoosa	638	1972 - 1978
T35N, R6E, Sec 10, 11, 14, 15, 22, 23, 27	Austin-Chamook BD	Yoosa	270	1984
T35N, R6E, Sec 10, 15	Chamook Ridge	Yoosa	70	1979
T35N, R6E, Sec 11, 12, 13, 14, 23, 24	Mox Cr	Yoosa	1321	1983-1985
T35N, R6E, Sec 11, 14, 15, 22	Mox Remains	Yoosa	260	1995-1996
T35N, R6E, Sec 12 T35N, R7E, Sec 5, 6, 7,8	Prism Cr.	Yoosa	480	1987-1988
T35N, R6E, Sec 13, 23, 24	Austin R/W	Yoosa	41	1980
T35N, R6E, Sec 15	Easy Pickens Pulp	Yoosa	12	1983
T35N, R6E, Sec 15, 22, 23	Cedar Chamook Salvage	Yoosa	18	1999
T35N, R6E, Sec 22	McClusky Cuttoff	Yoosa	212	1981-1982
T35N, R6E, Sec 22, 27	Big Mac OSR	Yoosa	180	1991
T35N, R6E, Sec 23	Lookout #1	Yoosa	57	1974
T35N, R6E, Sec 23	Lookout #2	Yoosa	57	1979

T35N, R6E, Sec 23	Aussie CP SSTS	Yoosa	216	1983
T35N, R6E, Sec 23	April Cr OSR	Yoosa	36	1983
T35N, R6E, Sec 23	Lookout Chawapiti	Yoosa	59	1991
T35N, R6E, Sec 23	Austin Salvage	Yoosa	39	2002
T35N, R6E, Sec 27, 28, 33,	Cham Hi-Risk	Yoosa	155	1976
T35N, R6E, Sec 3, 4	Camp CP	Yoosa	65	1983
T35N, R7E, Sec 3, 4, 5, 8, 9 T36N, R7E, Sec 34	Knoll Cr	Yoosa	774	1984-1985
T35N, R7E, Sec 5, 6 T36N, R7E, Sec 31, 32	Tray Cr	Yoosa	235	1981
T35N, R7E, Sec 7, 8	Prism Cedar	Yoosa	4	1991
T36N, R7E, Sec 29, 30, 31, 32	Snowy Camp	Yoosa	188	1987
	*** TOTAL ACRES TREATED =**		22662	

* Total acres treated are the cumulative result of multiple entries.

Present & Foreseeable Timber Harvesting Above Musselshell in the Lolo Drainage

TRS	Timber Sale	Drainage	Estimated Treatment Acres	Year Proposed
T35N, R6E, Sec 9, 10, 14, 15, 16, 17, 20, 21, 22, 23, 28, 29, 32, 33 T36N, R6E Sec 4, 5	White White TS	Lolo	7,000 ac	Planned 2005-

Past Decommissioned Roads or Replaced Culverts in Lolo Drainage above Musselshell

TRS	Project	Drainage	Action	Year Completed	Miles
T35N, R6E, Sec 22	Chamook Creek	Yoosa	Fish Passage Culvert installed	2001	
T35N, R6E, Sec 15	Mox Creek	Yoosa	Fish Passage Culvert installed	2001	
T34N, R6E, Sec 5	Nevada Creek	Lolo	Fish Passage Culvert installed	2004	
T35N, R6E, Sec 16, 17, 20	Road No. 5136	Lolo	Decommission	2004	1.7
T35N, R6E, Sec 20	Road No. 73035	Lolo	Decommission	2004	0.4
T35N, R6E, Sec 16	Road No. 805131	Lolo	Decommission	2004	0.2
T35N, R6E, Sec 16, 20	Road No. 805116	Lolo	Decommission	2004	0.3
		TOTAL MILES OF ROADS DECOMMISSIONED =			2.6

Present Culvert Removal and Road Decommissioning Projects

TRS	Project	Drainage	Action	Proposed Completion	Miles
T36N, R6E, Sec 24	Lolo Creek	Lolo	Fish Passage Culvert install	2005	
T36N, R6E, Sec 24	Belle Creek	Lolo	Fish Passage Culvert install	2005	
T34N, R6E, Sec 33	Nevada Creek	Lolo	Fish Passage Culvert install	2005	
T35N, R6E, Sec 29	Lolo Trib	Lolo	Fish Passage Culvert install	2005	
T35N, R6E, Sec 16	Lolo Trib	Lolo	Fish Passage Culvert install	2005	
T35N, R6E, Sec 27	Road No. 523B	Yoosa	Decommission	2005	0.95
T34N, R6E, Sec 5	Road No. 5133	Nevada	Decommission	2005	1.2
T34N, R6E, Sec 5	Road No. 73038	Nevada	Decommission	2005	0.4
	TOTAL MILES OF PROPOSED ROAD DECOMMISSIONING =				2.55

Reasonably Foreseeable Culvert Removal and Road Decommissioning Projects

TRS	Project	Drainage	Action	Proposed Completion	Miles
T35N, R6E, Sec 9, 10,	White White TS Project Area	Lolo	Decommission	Planned	20.4 mi
14, 15, 16, 17, 20, 21, 22, 23, 28, 29, 32, 33	White White TS Project Area	Lolo	Intermittent Storage	Planned	14.9 mi
T36N, R6E Sec 4, 5	White White TS Project Area	Lolo	Culvert Replacement/Removal (8)	Planned	14 river miles

Other Present and Reasonably Foreseeable Projects

Location	Project	Drainage	Proposed Completion	Acres or Miles
Lolo	Cattle Grazing	Lolo	Ongoing	Tbd
Lolo Drainage Above Musselshell	Routine road maintenance	Lolo	Ongoing	24 miles
Lolo Drainage Above Musselshell	Lewis & Clark Bicentennial - Increased visitors through 2006	Lolo	Through 2006	n/a

Past, Present & Foreseeable Mining Activities in the Lolo Drainage above Musselshell

TRS	Mining Project	Drainage	Estimated Acres	Year
T36N, R6E, Sec 3	Pioneer Mine Waste Pile Exploration	Dutchman	0.1	Ongoing

Moose Creek

Past Harvesting - Moose Drainage

TRS	Timber Sale	Drainage	Estimated Treatment Acres	Year Completed
T40N, R10E, Sec 13, 24 25 T40N, R11E, Sec 16-23 & 26-30	Cedar-Trout	Deadwood, Independence, Osier	2681	1958-1967, 1976, 1978, 1983
T40N, R11E, Sec 8, 9, 10, 15, 16, 21, 22	China-Osier	Osier	806	1972-1977
T40N, R10E, Sec 13, 14, 23, 24, 25 T40N, R11E, Sec 30, 31	Deadwood	Deadwood	537	1967-1979
T40N, R11E, Sec 20	Deception Saddle	Osier	13	1981
T40N, R11E, Sec 10, 15, 16, 21	East Osier Salvage	Osier	86	1975-1982
T40N, R11E, Sec 19, 20, 29	Independence Creek	Independence	54	1972-1978
T40N, R11E, Sec 8, 9, 10, 15, 16, 21, 22	Independent Moose	Independence	367	1980-1981
T40N, R11E, Sec 12, 26, 27, 34	Laundry Ridge	Osier	46	1981
T40N, R11E, Sec 23	Laundry Salvage	Osier	59	2000
T40N, R11E, Sec 22, 23 26, 27, 34, 35	Overlook	Osier	255	1981-1985
T40N, R11E, Sec 3, 4, 8, 9, 10, 11, 13, 14, 15, 23	Pre-Exchange Harvest Champion/DAW Lands	Osier	3360	1958-1968 1969-1979 1980-1988
	TOTAL ACRES TREATED =		8264	

Past Mining Projects - Moose Drainage

Location	Project	Drainage	Estimated Acres	Year
T40N, R11E, Sec 5	Lilly Placer Dragline mining	Moose	30	1957
T40N, R11E, Sec 29	Black Bear Exploration	Independence	0.5	1988
T40N, R11E, Sec 17	G and G Mining	Osier	0.5	1988

Present and Foreseeable Projects - Moose Drainage

Location	Project	Drainage	Estimated Treatment Acres	Year
FS Road 255	Routine road maintenance	Moose	19 miles	Ongoing
T40N, R12E, Sec 31	Pollock Ridge Fuels	Osier	6000	2005
T40N, R11E, Sec 20	Crawford Mining Exploration	Osier	0.2	2009-2012