

## **EXECUTIVE SUMMARY**

The Clearwater National Forest 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 what is now the National Forest. Two of the more productive streams, Lolo Creek and Moose Creek (including two tributaries, Independence Creek and Deadwood Creek), have had sporadic mining activity over the years. With the rise in 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 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.

Lolo Creek and Moose Creek are most frequently mined by part-time, small-scale operations using suction dredges with nozzles from two to five inches in diameter and gasoline-powered pumps up to 15 horsepower. 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 miners conducted their suction dredge operations by submitting a Notice of Intent under Forest Services Regulations and by applying to the Idaho Department of Water Resources for a stream alteration permit. The State permit required compliance with a list of specific terms and conditions (“best management practices,” or BMPs) 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 National Forest to have insignificant 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. Steelhead occur in Lolo Creek, and bull trout occur in both Lolo Creek and Moose Creek --- steelhead are not found in Moose Creek due to the downstream Dworshak Dam. After the 2001 mining season, Clearwater National Forest initiated the process of consultation, under §7 of the Endangered Species Act, with the National Marine Fisheries Service (NOAA Fisheries) and the 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. Pending completion of these consultations, the Forest Service has not approved any plans of operation for dredging in Lolo Creek or Moose Creek, and no approved dredging has occurred since the 2001 mining season.

In a 2002 Biological Assessment (BA) completed by the Forest Service 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 their respective Biological Opinions, NOAA Fisheries and USFWS agreed with the Forest Service’s determinations. Both agencies further concluded that suction dredging would not jeopardize either species if specific conservation reasonable and prudent measures were adopted.

## **Purpose and Need**

Clearwater National Forest now proposes to allow future approval of suction dredge plans of operations in Lolo and Moose Creek if they comply with specific operating requirements and implement specific mitigation measures.

NEPA requires that a detailed analysis — an environmental impact statement (EIS) — be prepared for “...major federal actions significantly affecting the quality of the human environment.” Because small-scale suction dredging may adversely affect species listed as threatened or endangered under the Endangered Species Act, the Forest Service has determined that approval of plans of operations would be a “major Federal action” within the meaning of NEPA and thus must be analyzed in an EIS. This EIS evaluates and discloses the potential environmental impacts of Forest Service approval of small-scale suction dredge operations that meet specific terms and conditions, and of feasible alternatives. It is important to note that Alternatives 2 and 3 do not encompass actual approval of proposed plans of operation, nor would any subsequent Record of Decision. Rather, they would allow Forest Service approval of future proposed plans of operation if they meet specified operating and mitigation requirements.

## **Alternatives Carried Forward for Evaluation**

### **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 Plans of Operations. 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 operations. No suction dredging would be allowed under the Mining Laws or under any other authorization.

This alternative could not be implemented under current law, including the Mining Law of 1872, and violates Forest Service regulations at 36 CFR 228A. However, this alternative provides a comparable environmental baseline against which to evaluate effects of the action alternatives. This is consistent with and legal under NEPA, which allows for analysis of alternatives that are not allowed under current law or regulations but that are valuable for exploring the range of effects.

Under this alternative, there would continue to be approximately the same level of traffic on Forest roads and approximately the same level of dispersed camping and other recreational activities.

## **Alternative 2: Suction Dredging**

Under this alternative, Clearwater National Forest would approve, with no further NEPA analysis, proposed Plans of Operation in specified reaches of Lolo Creek and Moose Creek (including two tributaries, Independence Creek and Deadwood Creek) if the operator agrees to specified operating conditions and mitigation measures that are designed to protect threatened and endangered fish species and their habitat. The maximum number of operations that could be approved in any year would be 18 for Lolo Creek and 38 for Moose Creek.

The terms and conditions with which proposed plans of operations would have to comply in order to qualify for approval under this alternative are based on the reasonable and prudent measures listed in the Biological Opinions prepared by NOAA Fisheries (2003) and USFWS (2003). The Forest Service has added additional elements to some terms and conditions and also included additional conditions in response to concerns raised during scoping.

Under this alternative, a claimant or operator would submit to the District Ranger a proposed plan of operations that included all of the specified terms and conditions. The proposed plan would provide site-specific information sufficient for the District Ranger to determine that the terms and conditions would be adequate for protection of surface resources on that specific site.

If the District Ranger determines that the proposed plan of operations meets the conditions and they are sufficient to protect surface resources on that site, the plan of operations could be approved with no further NEPA analysis. If the Ranger determines that the plan of operations does not meet these conditions and/or cannot protect surface resources, the District Ranger would not approve the plan of operations without revisions to the plan or completion of a separate NEPA analysis on that plan. Any separate NEPA analysis would require a separate Endangered Species Act §7 consultation with USFWS and/or NOAA Fisheries.

Approval would be in effect for the duration of the operating season from July 1 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 and approved for each operation before each mining season.

## **Alternative 3: Suction Dredging and Stream Improvement Projects**

This alternative is the same as alternative 2, except that it includes two specific stream improvement projects.

The first project involves bank stabilization and reclamation of the abandoned Lolo #5 mining claim on Lolo Creek. The mitigation project would stabilize and reclaim approximately 260 meters of Lolo Creek, and would include the following components.

- Regrade and reclaim existing placer tailings away from the current channel to provide stable non-erodible slopes and to blend the local landscape into existing topography.

- Regrade and reclaim existing placer tailings away from existing emergent wetlands that have formed in parts of the old channel and prevent erosion of materials into these wetlands.
- Rehabilitate and restore the existing creek to provide stable banks and a new channel that is geomorphologically and hydraulically stable and provides suitable aquatic habitat with riparian vegetation along stream banks. This may include rerouting the channel to provide increased meandering, lowering the current gradient, and regrading to provide a functional floodplain.

The second project would involve installation of a fish-friendly drainage device or ford with concrete planking where there is now an unimproved ford where Forest Road 5440 crosses Independence Creek. Neither of the projects would take place during critical salmonid spawning or migration periods, and both would follow all appropriate Best Management Practices to minimize short-term impacts due to construction.

## **Environmental Consequences**

**Hydrology and Stream Discharge.** Watershed conditions and management would remain unchanged under the No Action alternative. Suction dredging under Alternatives 2 and 3 would not introduce sediment to or increase sediment in the Lolo Creek or Moose Creek study areas but rather would relocate it by removing it from the substrate, passing it through the suction dredge, and replacing it into the creek, where it would settle out within a short distance. Thus, allowing approval of small-scale suction dredging plans of operations would not affect the amount of stream flow, water yield, or annual sediment yield produced in either the Lolo Creek or Moose Creek watersheds. Alternative 3 would reduce annual sediment yield from the Lolo #5 mining claim and from the Independence Creek ford.

**Stream Geomorphology.** Channel geomorphologic conditions would remain unchanged under Alternative 1, the No Action alternative. Under both Alternative 1 (No Action) and 2 (Suction Dredging), unstable banks in the Lolo #5 area would remain unstable and would continue to provide a source of sediments to Lolo Creek. The channel would remain channelized, which could result in increased scour upstream and downstream, and also could propagate further upstream and/or downstream.

Under both Alternative 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects), operators could disturb instream structures such as large boulders and large, stable woody debris. This could affect the energy and direction of stream flow and cause erosion and long-term changes in the channel. Operators must agree not to disturb such structures in order to be approved, so the potential for such impacts will be minimized. Under Alternative 3 (Suction Dredging and Stream Improvement Projects), stream channelization would be reduced and would be restored to a more stable condition.

**Water Quality.** Fine sediment and turbidity levels in Lolo, Deadwood, Independence, and Moose Creeks would remain low under the No Action alternative. Existing roads and camping would continue to contribute low levels of sediment and turbidity, as would the Lolo #5 mine area on Lolo Creek and the Independence Creek road crossing.

Under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects), there could be accidental spills of chemicals or wastes by suction dredge operators. Terms and conditions of approval should minimize the potential for such incidents. Under Alternative 3 (Suction Dredging and Stream Improvement Projects), there would be some added short-term potential for spills from construction projects. Implementation of Best Management Practices during construction would minimize the potential for such spills.

Suction dredging occurs in the confines of the stream channel and does not result in the discharge of any new sediment to the creeks, but rather moves sediment from the streambed through the dredge and then back to the creeks. There is relatively little fine material in Lolo Creek, but somewhat more in Moose Creek. The low stream velocities that occur in July and August in both Lolo Creek and Moose Creek would prevent any long-distance downstream transport of sediment. Thus, it is unlikely there would be increases in turbidity above the limit established by the Idaho Department of Environmental Quality. Any increases in turbidity would be for a very short duration while the dredge is operating. Any fine sediment that might be removed from the substrate and discharged back into the water column would drop out within a short distance downstream, particularly in areas where stream velocities are greatly slowed, such as a pool. Operators are required to monitor the stream for 300 feet downstream immediately after beginning operation; if they observe noticeable turbidity, they must stop or reduce operations until there is no visible increase 300 feet downstream.

In addition, under Alternative 3 (Suction Dredging and Stream Improvement Projects), regrading and stabilization of the tailing materials and disturbed areas at the Lolo #5 mining claim would stabilize exposed stream banks and reduce or eliminate further sedimentation and increases in turbidity from this area. Exposed sediment sources from piles of dredge tailings and overburden materials would be regraded and reclaimed to prevent future erosion and delivery of sediments to Lolo Creek. The project would reduce sediment loadings into Lolo Creek and improve water quality over the longer term. Similarly, installation of a drainage device or ford with concrete planking at the Forest Road 5440 crossing of Independence Creek would stabilize the channel and reduce the sediment and turbidity that result from and around the current ford.

**Fisheries.** Under Alternatives 1 (No Action) and 2 (Suction Dredging), fish habitat in the Lolo #5 area on Lolo Creek would continue to be degraded due to channelization and increased sediment, and the current ford at Forest Road 5440 would continue to be a partial fish barrier on Independence Creek.

In any given year, suction dredges under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects) could affect up to about nine percent of aquatic habitat in the Lolo Creek study area and about 10 percent of the Moose Creek study area that meet substrate sizes.

The window for dredging operations would occur from July 1 to August 15. This would minimize impacts to most larval and juvenile fish, and would be after steelhead trout and bull trout emerge from the substrate.

Salmonid alevins (larval stage between the egg and free-swimming fry or juveniles) could be crushed underfoot by operators, they could be trapped or smothered by tailings or fine sediment, and they could be entrained into the suction dredge intake. In Lolo Creek, where steelhead trout and chinook salmon occur, the likelihood of this occurring is considered to be low because only a small area subject to suction dredging overlaps areas suitable for spawning, and because operations would generally not overlap with the times steelhead and chinook would be present. In both Lolo Creek and Moose Creek, operators are allowed only in areas of large substrate not preferred by steelhead and bull trout, and operators have to use a 3/32-inch screen over their intake hoses. All of these conditions, combined with the fact that the Forest Service must inspect the operations at least five times during the suction dredge season, should minimize the potential for impacts to fisheries.

There would be minimal impacts from disturbance and dislocation due to the small-scale nature of individual operations and terms and conditions that require restoration of the substrate. As noted above, there could be spills or increased sediment and turbidity, but the terms and conditions with which operators must comply should minimize the potential for any impacts on water quality.

Alternative 3 (Suction Dredging and Stream Improvement Projects) would lead to long-term improvements in fish habitat in the Lolo #5 area of Lolo Creek, and would remove a partial fish barrier on Independence Creek.

**Instream Habitat.** Under Alternative 1 (No Action), there would be no change in instream habitat. Suction dredging under Alternatives 2 and 3 could lead to short-term changes in habitat but terms and conditions of approval would prevent any long-term adverse changes. Although operators would disturb small distances of the creeks during the mining season, they have to restore the substrate by the end of the operating system.

Dredging could destabilize instream wood, potentially reducing its stability and causing it to move from its natural location. Destabilizing instream wood could reduce pool frequency and quality and streambank stability. However, operators must agree not to remove or otherwise disturb instream wood, so there should be no effects on woody debris that enhances fish habitat.

Small suction dredging operations could increase pool frequency where dredging excavates pools and could decrease pool frequency where pools are filled by deposited tailings. An increase in pool frequency could temporarily improve stream channel diversity, a condition beneficial to many fishes and aquatic organisms. However, all operators would have to backfill all excavated pools by the end of the mining season.

Suction dredging could alter pool dimensions and quality through excavation, dredge pile deposition, or changes in channel morphology. Operators must fill all deepened pools by the end of each mining season, so any changes would be temporary.

Dredge operators may not dam streams, but some operators may build temporary rock barriers partially across the channel to facilitate flotation of dredges. Operators would have to break

down all dredge piles by the end of the operating season. Overall, any impacts from suction dredging would be very localized and minor.

**Aquatic Invertebrates.** The operation of small-scale suction dredges would displace some insects downstream but should result in minimal amounts of injury or mortality to aquatic insects. For a short period, while insects were in the water column before settling back into the substrate, they would be more susceptible to being eaten by fish or other aquatic organisms. This would be temporary.

Exposure of previously buried substrate and covering of existing substrate can locally reduce abundance of benthic invertebrates. However, most aquatic invertebrate species can re-colonize disturbed sites within several weeks.

Dislodged fine sediment would be distributed downstream of the dredged area and could temporarily fill interstices in gravel and cobble, reducing available macroinvertebrate habitat in the immediate area. However, scouring action during the next period of high flow would likely clear out any such sediment accumulations and allow aquatic insects to re-colonize the habitat. Also, the low percentage of fine sediment, particularly in Lolo Creek, would significantly reduce the likelihood and extent of potential temporary impacts.

The Lolo #5 restoration project would temporarily disturb the entire stream width for over 1,000 feet of Lolo Creek, and would kill or displace aquatic invertebrates in this area. Fine sediment in the disturbed area would be washed downstream and could temporarily reduce macroinvertebrate habitat. Over the longer term, stabilizing banks and creating a stable channel would reduce sediment transport and improve habitat for aquatic invertebrates.

The Independence Creek improvement project, similarly, would disturb the full width of the creek and result in increased sedimentation immediately downstream until seasonal high flows scoured out accumulated sediments. Following completion of the project, the upstream reach of Independence Creek will be open to migrating fish.

**Threatened and Endangered Fish.** Three species of threatened fish occur in Lolo Creek and/or Moose Creek. Fall-run chinook salmon, steelhead trout, and bull trout all occur in Lolo Creek. Only bull trout occur in Moose Creek; the downstream Dworshak dam blocks migration of anadromous fish, including chinook salmon and steelhead trout.

**Chinook Salmon.** A reach of the mainstem Clearwater River has been designated as critical habitat for fall-run chinook salmon. There would be no impacts from the No Action Alternative. The closest essential fish habitat for fall-run chinook is over 25 miles downstream of the Lolo Creek study area, and fall-run chinook are not known to spawn in the Lolo Creek study area, so suction dredging under Alternatives 2 (Suction Dredging) or 3 (Suction Dredging and Stream Improvement Project) should not cause impacts to fall-run chinook. Although spring-run chinook are not listed as threatened in the Clearwater National Forest, they are present in Lolo Creek, and natural populations are supplemented by fish from the Nez Perce Tribal Hatchery. The mining season (July 1 through August 15) occurs after the previous year's brood offspring are out of the gravel and prior to current-year spawning, so potential impacts to spring-run

chinook should be limited to displacement or avoidance during the hours of dredging activity and localized reductions in macroinvertebrate food availability. The stream improvement projects under Alternative 3 would disturb 290 meters of Lolo Creek and a few meters of Independence Creek during construction. The construction would use Best Management Practices to minimize impacts and would not occur during critical periods.

***Steelhead Trout.*** The Lolo Creek steelhead population is a combination of natural and hatchery fish, and the creek produces very few natural steelhead due to poor adult returns and habitat conditions. Spawning and juvenile rearing does occur in Lolo Creek; juveniles have been documented to occur at most sampling stations. There would be no impacts from the No Action Alternative. The dredging season under Alternatives 2 (Suction Dredging) or 3 (Suction Dredging and Stream Improvement Project) occurs after most steelhead emerge from the substrate and before juveniles migrate downstream, so there should be minimal direct impacts. The major effect to steelhead trout from suction dredging would be displacement of fish during dredging operations and possible delays in fish movement through the dredge area. The terms and conditions of approval would minimize or avoid adverse effects on steelhead trout populations and habitat. The stream improvement projects under Alternative 3 would disturb 290 meters of Lolo Creek and a few meters of Independence Creek during construction. The construction would use Best Management Practices to minimize impacts and would not occur during critical periods of the steelhead life cycle.

***Bull Trout.*** In the Lolo Creek project area, no bull trout were identified during 1996-1999 and 2001 monitoring, despite extensive fish surveys, and only six bull trout were identified from 570 survey stations in Lolo Creek from 1987 to 1994. Habitat conditions and warmer temperature regimes limit bull trout production in the Lolo Creek drainage, and fish population data do not indicate any bull trout spawning and early rearing in the Lolo Creek drainage. In Moose Creek drainage, fish population data prior to 2000 indicated that limited bull trout spawning and rearing was occurring. However, additional snorkeling surveys conducted during 2000-2001 found higher numbers of adult bull trout. Due to past mining, road construction and timber harvest, habitat conditions have been degraded in the Moose Creek drainage, and the drainage has been designated an adjunct watershed for future bull trout recovery efforts. Under the No Action Alternative, there would be no effects on bull trout. In Lolo Creek, suction dredging under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects) would have minimal impact because there are very few bull trout present, there is limited to no spawning and rearing, and because the suction dredge operating season is during a period that minimizes the likelihood of bull trout being present or spawning in the project area. In Moose Creek, there is some potential for impacts to bull trout from displacement and from habitat alteration. Under Alternatives 2 and 3, no dredging would be allowed in areas where bull trout are known to spawn, or in areas the Forest Service identifies as spawning habitat. In addition, the impacts of small-scale suction dredging on bull trout eggs, alevins, or fry would be minimal because bull trout hatch in January and February, remain in the gravel until only April or May, and then leave the gravel before the dredging season opens on July 1. Terms and conditions of approval would minimize the potential for impacts from habitat alteration. The stream improvement projects under Alternative 3 would disturb 290 meters of Lolo Creek and a few meters of Independence Creek during construction. The construction would use Best

Management Practices to minimize impacts and would not occur during critical periods of the steelhead life cycle.

**Westslope Cutthroat Trout.** Impacts to cutthroat trout, which has been proposed for listing as a threatened species, would be similar to those for steelhead trout and bull trout described above.

**Wildlife.** Potential impacts of suction dredging on terrestrial wildlife would be predominantly within the riparian zone along the streams. Management indicator or sensitive wildlife species possibly affected would include belted kingfisher and boreal toad nesting. Minor disturbance by traffic and dispersed camping would continue under the No Action Alternative. The presence of suction dredge operations under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects) could disturb kingfishers nesting in the immediate vicinity of their operations and reduce breeding success. Once eggs hatch, brood rearing by kingfishers would be essentially complete prior to the mining season so there would be no effects on rearing young. Foraging individuals could be locally disturbed and move away from dredging operations to hunt. Aquatic amphibians (e.g., boreal toad) could be affected through entrainment of eggs and young in the early stages of development. Approval conditions prohibit suction dredging into the banks of streams, which are the areas that could potentially cover amphibian eggs and preferred habitat, and this would reduce the potential for impacts.

Potential impacts to threatened, endangered, or sensitive wildlife species would be negligible. Additionally, lynx, and gray wolves are not known to inhabit the project areas. For at least 10 months of the year, the temporary noise and other human impacts associated with small-scale dredging would not likely jeopardize the continued existence of the gray wolf, and would result in no adverse effect on bald eagles, lynx, or their habitats.

Under Alternative 3, noise and human activity associated with construction of the Lolo #5 restoration project and installation of a drainage device or ford with concrete planking at the Forest Road 5440 crossing on Independence Creek would cause wildlife to avoid the areas, at least during the hours of operation. Individual kingfishers and boreal toads could be disturbed and dislocated, and toads could be killed. Otherwise, there would be no significant effects on individual organisms or populations.

**Riparian Vegetation.** There would be no effects on riparian vegetation under the No Action Alternative. Suction dredging under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects) would not substantially alter riparian vegetation and wetland plant communities in either Lolo Creek or Moose Creek. Stream banks are generally well vegetated and cobbles and boulders provide armor to the banks. Equipment would be manually moved across the riparian zone to the dredge site.

Suitable habitat for Macfarlane's four-o'clock (*Mirabilis macfarlanei*), water howellia (*Howellia aquatilis*) and Ute ladies'-tresses (*Spiranthes diluvialis*) was modeled as part of the Endangered Species Act consultation process. The Lolo Creek and Moose Creek watersheds did not contain suitable habitat for these three federally listed plants.

Under Alternative 3, the restoration of Lolo Creek in the Lolo #5 area would have a short-term adverse effect on existing riparian vegetation and wetlands, but would ultimately increase channel stability and increase the stability and quality of riparian habitat by reducing future damage from high stream flows. Prior to project implementation, the Forest Service would identify and delineate any jurisdictional wetlands in the Lolo #5 project area and comply with any applicable requirements under §404 of the Clean Water Act.

**Recreation.** Both the Lolo Creek and Moose Creek project areas are managed as “Roaded Natural” under the Recreation Opportunity Spectrum (ROS), which is characterized by mostly natural-appearing landscapes with some chance for privacy. Moose Creek is more remote and has fewer visitors. The Lewis and Clark National Historic Trail is near the southern boundary of the Lolo Creek project area and the Nez Perce (Nee-Me-Poo) National Historic Trail crosses the northern part of the Lolo Creek project area.

There would be no change in recreational use or impacts to recreational visitors under the No Action Alternative. Suction dredging under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects) should have minimal or no impact on to recreation visitors and no change in the ROS in either Lolo Creek or Moose Creek. Most people camping in the immediate vicinity of the mining claims are miners or prospectors, so the impacts of noise from suction dredge pumps and/or compressors would not be expected to be annoying, or not as annoying as they would be to non-miners. Because non-mining campers generally prefer other areas for camping, it is likely there would be no increase or decrease in campsite concentration, and thus no overall change in the number of recreational visitors.

Suction dredge operations would generally make the areas unproductive for recreational fishing during the mining season and to some extent continuing until insects and other food organisms re-establish populations in the substrate. However, these streams are unlikely to attract significant fishing activity since there are more productive streams near each watershed.

Under Alternative 3, heavy equipment would be needed for both the stream restoration in Lolo Creek and the crossing improvement project on Independence Creek. This should not affect suction dredge operators. There would be noise and visual disturbance for the duration of the construction projects, however, which could have a minor effect on other recreational visitors. Because there are abundant other areas with the same or better recreational opportunities, there would be no significant effect on recreation from this alternative, and no change to the ROS in either watershed.

**Visual Resources.** Overall, neither of the study areas is very diverse, with a low to moderate degree of inherent scenic attractiveness. The creeks themselves are the only distinctive features. Neither of the areas have an assigned Visual Quality Objective (VQO). Travel routes and trails near Lolo Creek are managed with VQOs ranging from Retention (human activities not evident to casual visitors) to Partial Retention (human activities may be evident but remain subordinate to the characteristic landscape). Travel routes near Moose Creek are managed as Retention.

There would be no effects on visual resources under the No Action Alternative. Suction dredging under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream

Improvement Projects) would not cause changes to the VQOs. It is possible that suction dredge operations in Lolo Creek could be seen from either of the historic trails but this is unlikely due to topographic and vegetative screening. Views from the Lolo Creek Campground area would also be limited. Similarly, in both creeks some suction dredge operations could be visible to visitors on nearby roads, but again this is unlikely due to topographic and vegetative screening. Under Alternative 3, construction equipment would be visible from the roads during the relatively short periods while the stream restoration projects were being implemented.

**Noise.** Both the Lolo Creek and Moose Creek project areas are heavily forested natural environments where the creeks, wind, local topography, and vegetation all influence the acoustic environment. Similarly, noise from generators and other equipment on campsites, and from passing vehicles on Forest Service roads, would be audible to visitors. In the Lolo Creek project area, the primary sensitive noise receptors would be visitors in the Lolo Creek Campground and on the Nez Perce National Historic Trail or Lewis and Clark National Historic Trail. There are no sensitive noise receptors in the Moose Creek area other than non-mining recreational visitors. There would be no change from current conditions under the No Action Alternative.

Suction dredging under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects) would generate noise from pumps used to dredge material from the stream bottom and in some cases from an air compressor used to supply air to a dredge operator (there is no blasting associated with suction dredging). The maximum noise level at very close range for gasoline engines of the size used by suction dredge operators is approximately 60-70 decibels. The actual noise levels would depend on many variables, including distance between the receptor and the source, wind, atmospheric pressure, other weather conditions, topography, time of day, etc.

Unlike a resident, who is exposed to repeated noise events over time, a visitor may or may not experience a noise event during a visit. The people potentially affected during the mining periods would mostly be the miners themselves, hikers, fishermen, and other dispersed campers in the area.

**Socioeconomics.** The Forest Service assumes that the number of visitors and campers in the Lolo Creek study areas would be approximately the same whether suction dredging plans of operations are approved or not. Thus, the economic impacts of suction dredging under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects) would be generally equivalent to those from camping and other recreational use under the No Action Alternative. In Lolo Creek, using very conservative assumptions, estimated expenditures would be \$82,800 per year, which would amount to less than 0.06 percent of Clearwater County's total annual income. In Moose Creek, total expenditures would be \$138,000 per year, which would amount to less than 0.01 percent of the Missoula County's total annual income. This level of expenditure would have a negligible effect on county or larger-scale economies.

The amount of gold that is recovered by small-scale suction dredge operators is not known, so the loss of income that would result from not approving suction dredge plans of operations cannot be estimated. However, the Forest Service does not believe the amount is significant, and so the loss of income under the no action alternative would not have a significant effect on local

or larger-scale economies. In addition, total expenditures for equipment and fuel for each operator would be about \$700 per year, which would have no effect on local economies.

**Heritage Resources.** Suction dredging could affect heritage resources in both the Lolo Creek and Moose Creek study areas. Although a heritage resources inventory has not been completed in either study area, there are 14 recorded resources in the Lolo Creek area and 22 heritage resources sites in the Moose Creek area. Until a formal determination is made, these resource sites are treated as eligible for nomination to the National Register of Historic Places.

Under all alternatives, camping activities have the potential to adversely affect historic mining sites and Native American resources in both the Lolo Creek and Moose Creek areas. Under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects), suction dredging could affect resources within the creeks themselves. Should a suction dredge operator uncover a resource while working, work would have to be stopped immediately, pending inspection by the Forest archaeologist. This would minimize potential impacts on heritage resources. Under Alternative 3, restoration of the Lolo #5 area could affect any resources in that area; again, if any resources are discovered during construction, operations would stop pending inspection by a Forest Service archaeologist.

**Nez Perce Treaty Rights and Traditional Uses.** The Nez Perce Tribe has "... the right of taking fish at all usual and accustomed places...together with the privilege of hunting, gathering roots and berries..." in both the Lolo Creek and Moose Creek project areas. 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. They have indicated that Lolo Creek in particular is an important stream in restoration efforts for chinook salmon in the Clearwater River Subbasin.

Under the No Action Alternative, impacts to fish and other resources would not change from the current conditions. Under Alternatives 2 (Suction Dredging) and 3 (Suction Dredging and Stream Improvement Projects), suction dredging could cause potential impacts on tribal fishing access and traditional tribal resources. During the mining season, the areas being mined may not be the most desirable for tribal fishermen. Dredging noise, activities in and near the streams that scare away fish, and the presence of non-tribal members may make for a climate that is less than optimal for this traditional practice.

In addition, suction dredging could affect tribal hunting by making the area less desirable for tribal hunters and by causing game animals to avoid stream corridors during daylight hours. 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.

### **Potential Cumulative Effects.**

In the past, both Lolo Creek and Moose Creek have been impacted by road construction, timber harvest, mining, and grazing practices that added sediment to the stream. Except for channelization, excess sedimentation, and bank instability caused by past mining on Collette's abandoned mining claims (Lolo #5), the watershed is recovering due to the lighter intensity of management and improved management practices.

Impacts from these former activities (mostly road construction and timber harvest) are still evident in the stream channels. Although instream conditions are considered static, modeling indicates the current trend is hydrologic recovery in the watershed and decreasing sediment delivery to the stream channels. Therefore, instream recovery is expected to slowly occur in the next several decades. An improving trend in cumulative watershed sediment effects has been observed on a Forest-wide scale.

Timber harvest, grazing, and road maintenance is expected to continue in these watersheds. Each of these activities will have some impact in the vicinity of the proposed projects. Sediment generation, riparian vegetation degradation, and noise impacts are associated with these activities. No significant increases in any of these activities is expected, so there should be no increases in cumulative impacts.

### **Comparison of Environmental Consequences**

A comparison of environmental consequences and purpose and need criteria among the alternatives indicates that Alternatives 2 and 3 would be similar in terms of environmental consequences. Implementation of Alternative 3 would present some additional short-term construction-related impacts, but would result in long-term improvements to in-stream water quality and suspended solids conditions and would increase streambank stability.

### **Preferred Alternative**

The Forest Service has selected Alternative 3 (Suction Dredging and Stream Improvements) as the preferred alternative.